

# AUTOMOTIVE INDUSTRIES

## *The* AUTOMOBILE

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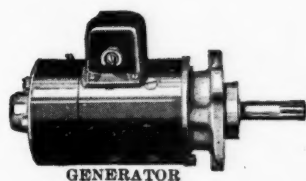
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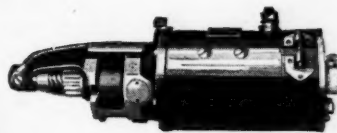
GENERATOR



COIL

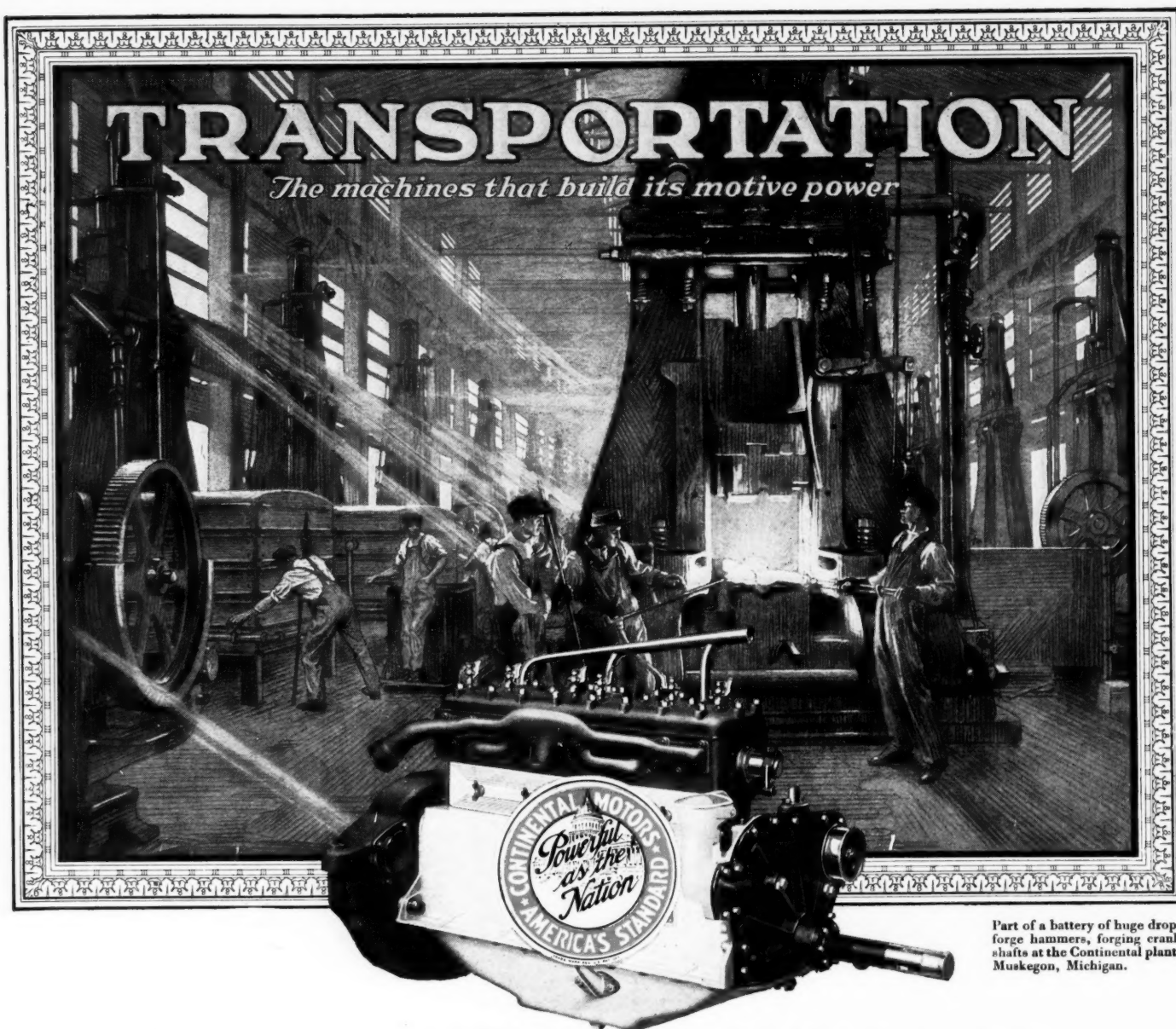


UNISPARKER



STARTER

ATWATER KENT MFG. COMPANY  
*Philadelphia*



Part of a battery of huge drop-forge hammers, forging crank shafts at the Continental plant, Muskegon, Michigan.

The quality that is inherent in Continental Red Seal Motors is a big factor, of course, in establishing good will for the manufacturer who adopts the Continental Motor as standard equipment. ¶ But there is another factor that is in existence today only because the Continental Motors Corporation began building toward that point years ago. It is PUBLIC APPRECIATION of Red Seal quality. ¶ The uniformly high standards of Red Seal manufacture, maintained over a long period of

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Largest Exclusive Motor Manufacturers in the World

# Continental Motors

STANDARD POWER FOR TRUCKS, AUTOMOBILES AND TRACTORS



# AUTOMOTIVE INDUSTRIES

## The AUTOMOBILE

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No. 13

## Why the French Automobile Production Program Failed

Two years ago France was talking of producing 200,000 motor cars annually. Now the industry is in a state of near-collapse. Here is a review of the events of the period between the talk of large production and the survival of the fittest.

By W. F. Bradley

**N**O French automobile factory has lived up to the production program mapped out at the end of the war, while prices fixed at that period have not even approximately been adhered to. In looking back over the period of 28 months, it is amazing that so many errors should have been made in the time required to get into production, in the cost price of cars, in the possibility of the home and foreign markets, and in the general conditions that would prevail and influence the automobile industry.

It was estimated that the production capacity of the French automobile factories, as enlarged under the war program, was 200,000 cars per annum. This estimate was never explained in detailed reports of factories, but it is known that many war equipment factories planned automotive production that have never really entered the business.

At least three firms, Citroen, Renault and Berliet, had production possibilities of 100 cars per day, or each of them the ability to meet the requirements of the whole of France on the pre-war standard.

Six others, Panhard, Darracq, De Dion Bouton, Clement Bayard, Lorraine-Dietrich and Peugeot, had production facilities for at least 10 cars per day, thus making a total for nine firms of 108,000 cars per annum. There are numerous factories not referred

to here which announced indefinite programs based upon war equipment factories. Also there are other automobile factories in France which did not announce definitely the production plans.

Never have the sales of automobiles in France exceeded 35,000 a year, and, granting that the sales would be doubled after the armistice, this left a large number of cars to be exported, if sold. French exports never reached a figure apparently anticipated in the disposal of this production.

These figures never have been reached by the industry as a whole, or by any single firm in the trade. Citroen united his workers a few days after the armistice and informed them that they must expect short time for a few months, but by the following March he guaranteed that they would be working on the same basis as during the busiest days of the war. Instead of this, Citroen was not in production until a year later, and, although he has been more successful in carrying out his plans than any others, he has never touched the 100-car-a-day figure, and is not likely to attain it in the immediate future. Probably the highest figure attained has been 75 cars per day, which constitutes a record for France; depression setting in, this had to be cut within a few weeks.

At the present time, despite the enlarged manufac-

turing facilities, the output of automobiles is not as high as immediately before the war. This means that the factories are all working well within 50 per cent of their possibilities; in certain cases the production is not more than 15 per cent of the capacity. The weeding out process proceeds slowly and is causing a minimum of disturbance in the industry, for the French factories, not being so highly specialized as those of America, it is an easier matter to get into other classes of production where the depression is less severely felt.

Renault is a pretty good example of this, for the automobile, truck and tractor business being insufficient to keep the works in full operation, he is now producing small tools, chains, jacks, hoists, change speed mechanisms, factory transmissions and stationary motors. Berliet is another big factory having had to convert to other lines of production, among these being railroad rolling stock. The French automobile factories not being big, as judged by American standards, and the fact that they had connections with other branches of engineering, or were able to convert with a fair amount of facility to other lines, has helped to attenuate the crisis in a considerable measure.

At the present time numbers of firms are merely living on the edge of the automobile business, and holding on to the industry in a precarious manner, although it undoubtedly would be to the benefit of all if these firms would drop out altogether. The French courts have shown a wonderful leniency, firms being allowed to remain in business by arrangements with the creditors, whereas in other countries they would have been forced into liquidation.

#### The Price Movement

France set out, after the armistice, with the idea that the era of economical motoring was about to break. Citroen's program was a four-passenger automobile with all modern improvements at 7,950 francs; Renault announced a slightly larger car, also with electric lighting and starting, spare wheels and five-passenger body, for 8,800 francs; Berliet promised a 15-h.p. complete car at 9,500 francs; Peugeot had a four-passenger model in preparation at less than 8,000 francs; Clement-Bayard intended to come into the same class, and Lorraine-Dietrich laid plans for a high-class six, on big production lines, which, it was expected, could be sold for about 12,000 francs.

Not a single program has been realized. Citroen climbed from 7,950 francs to 15,900, and has since dropped down to 14,310 francs; Berliet went from his original price of 9,500 francs to 23,500 francs; Peugeot got up to 21,000 for a model which it had been hoped to sell at one-third this price; the popular Renault jumped from 8,800 to 22,500 francs. These are but a few typical examples, but the same thing applied throughout the industry, although certain manufacturers displayed a spirit of reserve in fixing their car prices.

When the first post-war automobile show was held in 1919, a motor famine prevailed in France. Although a year had elapsed since the armistice, not a single factory had got into regular production, and the majority had nothing more than sample models to show, with very faint hopes of being able to deliver in less than another year. Clients were clamoring for cars, and orders flowed in, the show closing with practically all manufacturers booked up for two or three years ahead. Makers knew that there was no possibility of making deliveries within the time limits they had agreed to, yet, with very few exceptions, they continued to take orders. A few of the more conservative makers only accepted such orders as they knew they could execute, and declined the others.

During this apparently prosperous period makers failed to realize that they were being fooled by dealers and the public. Convinced that promises would not be kept, the dealer who had prospects for five cars placed his order with four different firms, intending later to cancel with those makers who did not live up to delivery dates. Had there been co-operation among manufacturers this danger could have been averted, but, although the French trade is grouped into two powerful trade associations, it was never thought to get together and verify the validity of the orders.

#### Duplicated Orders

It was not long before manufacturers realized they had made gross errors in calculating the cost of production, and in consequence prices began to soar until the peak was reached in the spring of 1920. The reasons given for the rises were the increased cost of coal and raw material, the 8-hour day and the consequent reduced efficiency of labor. There is no doubt that these had their influence on the production costs, but it is equally certain that, after the armistice, French makers established their selling prices light-heartedly and without any real knowledge of what it would cost them to produce.

On the whole, the public stood for the first rises without much complaint, but when deliveries were not forthcoming at even the higher prices, and in several cases it was announced that the cheap model had been withdrawn and replaced by a better and more costly type, the storm burst. Legal action was taken to compel manufacturers to deliver at the original price, and in some cases compensation was claimed for late delivery. The courts were divided, for while some decided that there had been increases in the cost of raw material over which manufacturers had no control, others concluded that manufacturers ought to have been able to foresee these increases and, in any case, it was they who ought to bear the consequences and not the clients. In certain cases the line of argument of the judge was that if there had been a decrease in the cost of raw material, manufacturers would not have voluntarily dropped the price to the client and, consequently, they were not justified in increasing it when conditions went against them. Adequate publicity was given to the cases decided in favor of the manufacturer, but not much was allowed to appear in print regarding the lawsuits decided against them.

#### The Orders Disappear

By the spring and summer of 1920 the public, as a whole, was convinced that it was being exploited by French automobile manufacturers, and, while some persons commenced legal proceedings, others simply cancelled their orders on the ground of late delivery. Naturally those dealers who had contracted for considerably more cars than they had ever hoped to get were very ready to take advantage of the cancellation clause, the final result being that manufacturers who had thought they were booked up for two or three years suddenly found themselves, in June and July of last year, with no genuine orders on their books.

Much as manufacturers have been criticized by dealers and the public for their actions during this period, it must be recorded that the faults were not all on their side. While the demand remained good, dealers refused to be tied down by price limits, and after getting cars on the understanding that they would be sold at the prevailing catalog price, they disposed of them to the highest bidder. The client imagined that the maker was responsible for this, and the reputation of the entire industry was damaged.

Although purchasers protested against the actions of



makers, they were not above taking advantage of the situation. One man of considerable local influence threatened legal action if he was not given delivery of a car at the original price. To avoid a legal action, the factory decided to stand the loss on the car by supplying at the initial price. Within 24 hours of getting delivery the client sold the car at a 25 per cent increase. In this case the dealer lodged a complaint with the public prosecutor for illegal speculation.

#### Move for Standardization

It always has been difficult to get French makers to pull together on matters of general policy, but even the hopes of united action which sprang up during the war have been doomed to disappointment. If tire and rim sizes are excluded, no standardization work has been done. Magneto bases have been made uniform, but this was a war measure.

Eight important manufacturers got together in 1919 to make purchases in common and to standardize the automobile industry, or at any rate their particular portion of it. The program was promising, and even went so far as a cheap car, the various parts of which would be built in the different factories and assembled and marketed for the benefit of the entire group. Offices were opened in the Champs Elysées and engineers set to work to adopt standards, without, however, paying any attention to the work which had already been done in this direction. Some of the engineers in this group admitted that they had never heard of the American standards promoted by the Society of Automotive Engineers. This organization had entirely disappeared within one year, owing to the inability of the manufacturers to work together. While the joint car was unnecessary, there was nothing in the rest of the program that was not perfectly feasible and likely to be beneficial to the industry.

The causes of the present depression in the French industry are multiple. It is doubtful if the increased cost of production is mainly responsible for the refusal of the public to buy, for there has been a small but gradual decrease in price during the past three months without any corresponding increase in purchasing. Gradually the public has been educated to higher car prices, but it cannot be made to accept the high operating costs now prevailing.

The Government 10 per cent luxury tax is not only unpopular but a real handicap to the whole of the industry, for it is impossible to convince the Frenchman that a Ford, a Citroen or a small Renault must be classed as an article of luxury. In order to overcome the effects of this tax Citroen instituted, and other makers adopted, the plan of paying the tax themselves, and presenting this as a reduction on the price of the car. In this way the pill is sugar-coated, but the purchaser does not entirely overlook the fact that it is still a pill. Frequent protests have been made by the industry against the luxury tax, and its repeal on at least small cars is constantly being urged, but without any result.

#### Taxation a Handicap

Another barrier to the progress of the industry is the high rate of taxation on automobiles. Even the smallest car pays 500 francs a year in direct taxation, while a

medium four-passenger car of the European type has to contribute 800 francs per annum to the state. In certain districts the annual tax on a Ford is almost 1,000 francs a year, or \$200 at nominal exchange. The Government plea is that funds are required and the automobile owner must pay, but there is no doubt that the total amount going into the treasury funds would be increased if the individual taxes were lowered.

The French automobile industry is being bled by the gasoline ring. When the Frenchman is called upon to pay 12 frs. 25c. for a 5-litre can of gasoline (67 cents per American gallon at present exchange) he is informed that American financiers who will do nothing to help bring down the rate of exchange are the profiteers. Gasoline is sold retail in New York at the present time at 30 cents a gallon, which at the prevailing rate of exchange (14 frs. to the dollar) would make the cost on the French market 4 frs. 52c. per 5-litre can, instead of 12 frs. 25c. The difference, 7 frs. 63c., represents shipping costs and the profit of the select ring which controls gasoline in France. In this sum is included a Government tax of 1 fr. per can.

A leader of the American oil industry has declared that if the present monopoly were removed gasoline could be sold retail in France at 5 frs. per can.

This would only be possible, however, by taking the business out of the hands of the present "refiners," whose refining operation consists in putting American gasoline into French cans and sticking labels on the cans. This group has no interest in the adoption of bulk storage and curb sales from gasoline tanks, with the consequence that the old-fashioned method of selling in cans, many of which will not contain the quantity they are supposed to

hold, and all of which entail some loss through evaporation, filling and leakage, remains in force. Gasoline economy by the use of small high-efficiency engines, by scientific carbureters and the best carbureter adjustments has been pushed to the limit. The great problem which now confronts the French automobile industry is cheap fuel. The industry is being strangled by high gasoline costs, and unless these costs are lowered or unless other and cheaper fuel is found, it is certain that the industry will be permanently crippled.

#### Pleas Are Unheeded

High taxes, high gasoline and oil costs and the accompanying increased charges for garage and repair work are the leading obstacles to the recovery of the French automobile industry. On several occasions the restrictive influence of these taxes has been brought to the attention of the Government, but even the leaders of the industry appear to be more concerned in getting further protection against outside competition, or in maintaining the present protection, than in removing the national restrictions. At present there is a desire to obtain the introduction of another prohibition period, despite the fact that the rate of exchange has completely killed American and English competition. Only Italy and Germany have an advantage under the exchange rates.

By the sale in France of the whole of the American and French army automobile stocks, the truck market has been saturated, and at the present moment the sale

(Continued on page 698)

#### Fluctuations in Automobile Prices on the French Market

	Armistice	Jan., 1920	July, 1920	Jan., 1921	March, 1921
	fr.	fr.	fr.	fr.	fr.
Citroen, 10 hp. 4-pass. ....	7,950	15,000	15,900	15,700	14,310
Berliet, 15 hp. 4-pass. ....	9,500	9,500	18,000	23,500	22,000
Delage, 6 cyl. chassis .....	45,000	55,000	70,000	63,000	48,000
Renault, 10 hp. 4-pass. ....	8,800	12,800	22,500	22,500	16,500
Ford, 4-pass..	10,500	18,000	20,070	15,000	13,900

# An Electric Truck for Industrial and Street Use

Combines in one vehicle features which adapt it for use between warehouse and dock when paving is good. Has short turning radius and elevating platform which enables quick handling and economy in time for loading and unloading, often without rehandling at destination.

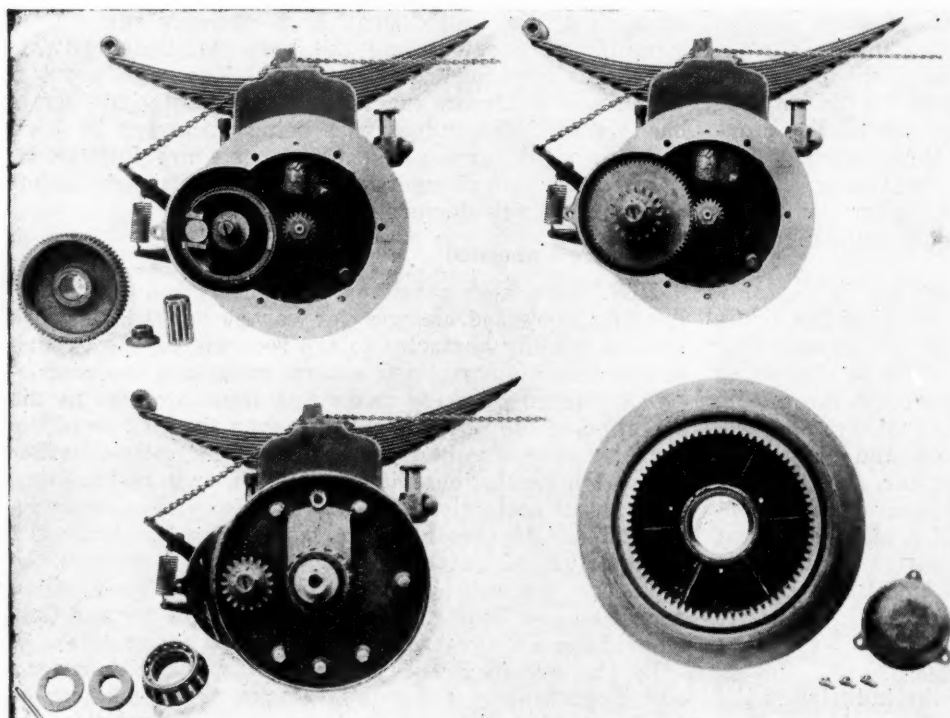
By P. M. Heldt

**W**HAT may be termed a cross between the regular industrial truck designed for use only on railroad platforms, steamship piers and factory floors, and the commercial truck for road service has recently been developed. It is based on the idea that there is a great deal of transportation between freight terminals and warehouses, for instance, which are only a short distance apart, say not more than a mile, and are connected by paved streets. If the freight is first handled at the dock or freight station on an industrial truck, then transferred to a commercial vehicle to be hauled to the warehouse and there again handled indoors on an industrial truck, a great deal of effort is wasted in loading and unloading. The Tec truck is designed to take the freight as it is unloaded from the steamer or freight car and carry it directly to its ultimate destination, even if this be on the top floor of a warehouse, provided the distance is not too great and the route is over hard surfaced roads.

In the design of this truck two points in particular were aimed at, namely, to secure unusual maneuverability, so as to be able to make short turns in factory and warehouse aisles; and to select such wheel and tire equipment as to

make it possible to run at considerable speed over ordinary paved streets rather than over floors only. The truck, moreover, is of the lifting type and is used in connection with a set of loading platforms on which the load is piled and from which it is removed while the truck is engaged elsewhere.

In order to secure maximum maneuverability the truck was made of the four-wheel drive, four-wheel steer type. In this way the turning radius is reduced to one-half what it would be with two-wheel steer and the same wheelbase and maximum steering wheel deflection. There is an electric motor on each wheel, so that the usual difficulties of transmitting power to a swiveled drive wheel are here eliminated, the motor turning with the knuckle in steering. The truck has a capacity of 5000 lb. and weighs complete 4700 to 4900 lb. There are five motors in all on each truck, four for the drive and the fifth, which is of the same size as the others, for operating the lifting jacks. All are G. E. motors, with the rating of 17 amperes at 60 volts. The manufacturers, the Terminal Engineering Company, Inc., make their own controllers, which give three forward and three reverse speeds, and also permit of the use of the

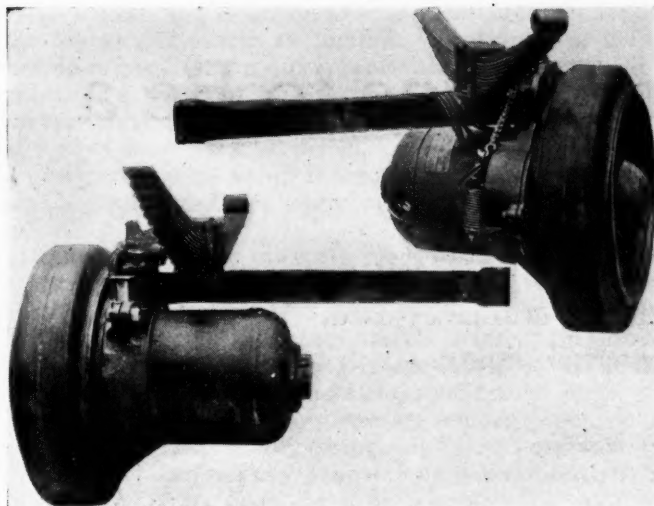


Details of driving gear and brake



Frame of Tec truck



*Axle with wheel and motor unit*

motors for braking purposes. The wheel drive gearing is built under the patents of the Commercial Truck Co. of Philadelphia. The drive from the armature shaft to the road wheel is by double reduction through a one-piece spur gear and pinion, the first reduction being from the spur pinion on the motor shaft to the intermediate spur gear, and the second from the pinion (integral with the intermediate gear) to the internal gear on the periphery of the road wheel. The mechanism, which is completely enclosed, is grease packed, and operates therefore under favorable lubricating conditions. There is an expanding brake on the intermediate gear of the drive to each wheel, and braking effort can be exerted on all four wheels.

The wheels are 20 in. in diameter and are fitted with 5-in. solid rubber tires. These tires are 3 in. deep, thus providing the same depth of rubber cushion as the solid tires on large-wheel street trucks, rather than the lesser cushion which is standard for indoor floor purposes.

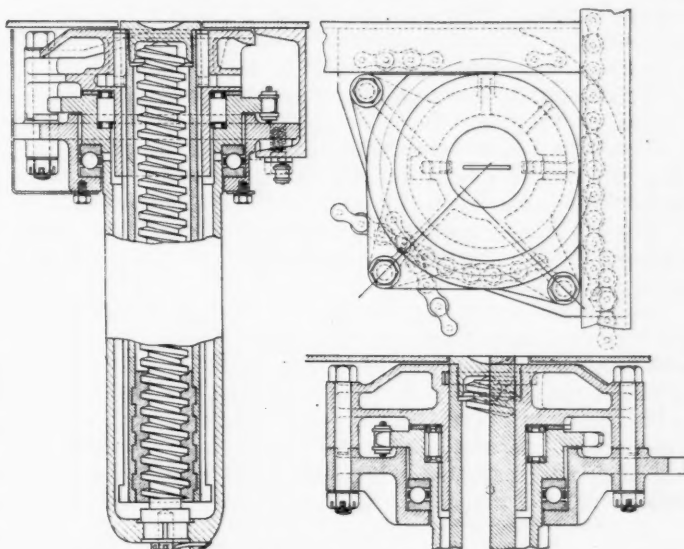
The frame is built up of 4-in. reinforced channel steel, hot riveted. It is supported on the axle by four half elliptic springs 26 in. long by 2 in. wide. The wheel units and jack units are packed with grease, so that the lubrication of the transmission gearing is effected automatically. Other bearing points are lubricated from oil reservoirs.

*Tec truck carrying loaded platform*

The elevating mechanism consists of four screw jacks driven by a roller chain. There is a spur gear reduction between the motor and the sprocket which operates the chain. This sprocket has a mechanical friction slip so there can be no danger of over-driving the elevating mechanism. One of the reasons for using the chain is that weaving of the truck frame does not cause binding in drive. The travel of the jacks is controlled from the dash. The maximum travel is 9½ in.

Either an Exide or an Edison battery can be used on the truck, the Exide being either the 34 cell M. V. 9 or the 35 cell M. V. 11 type and the Edison the 59 cell A-4 or G-6. There is a hinged cover in the truck deck, which permits of quickly changing the battery if it is desired to use the truck continuously. Another advantage of the hinged cover is that it permits of easy inspection of the battery. A charging receptacle of the Anderson type is provided, and there is an extra charging receptacle at the driver's platform for convenient use when charging the battery on the truck.

The controller is of the drum type and is mounted on the dash. Owing to the fact that a higher voltage is used

*Detail of lifting jacks and their chain-operating mechanism*

than the conventional industrial truck voltage, the operating current is comparatively low, and this, together with wide controller fingers, reduces the wear of these fingers. As a safety feature arrangements are made so that it is impossible to move the controller handle unless the operator is in the driving position. The speed range, light is ½ to 10 m.p.h. and with full load ½ to 7 m.p.h. Resistance is used in the main circuit only on the low speed, and on the high and intermediate speeds there is therefore no loss of current by resistance.

The frame is provided with stake pockets which are of steel, hot riveted to the inside of the frame, giving flush frame sides. Stakes can be conveniently carried in the rear of the dash when not in use. An automatic coupler is furnished with the truck. This has 2 x 8 in. double acting helical springs to prevent shocks when towing trailers, shifting loaded freight cars or when engaged in other heavy duty. The coupler can be released from the dash. The equipment furnished includes red and white running lights with Conophor lens, both front and rear. These lights are set in the frame so that they are protected against injury. Other items of equipment are an electric horn, license plate brackets, Veeder Odometer and a combination latch lock on the controller which securely locks

(Continued on page 711)

# New Four-Cylinder Engine to Be a Stock Product

Conventional construction employed for most parts, but cast iron cylinders and pistons are of harder metal than is ordinarily used. Pressure-splash lubrication employed, with no external piping.

By J. Edward Schipper

**A** NEW overhead valve,  $3\frac{1}{2}$  by 5 in., four-cylinder engine for the general trade is now being prepared for production. The engine is a block-cast unit with the cylinders integral with the upper half of the crankcase. It has a detachable cylinder head and an overhead valve arrangement operated through rocker arms from the camshaft located in the crankcase.

The combustion chamber surfaces are completely machined, so they will be alike in dimensions and finish. The cylinders are tested with the scleroscope and must show 38 points of hardness after annealing. This is rather hard for cylinder metal from the machining standpoint but gives extra endurance in service. The cylinder head is fastened to the block by thirteen heat-treated cap screws.

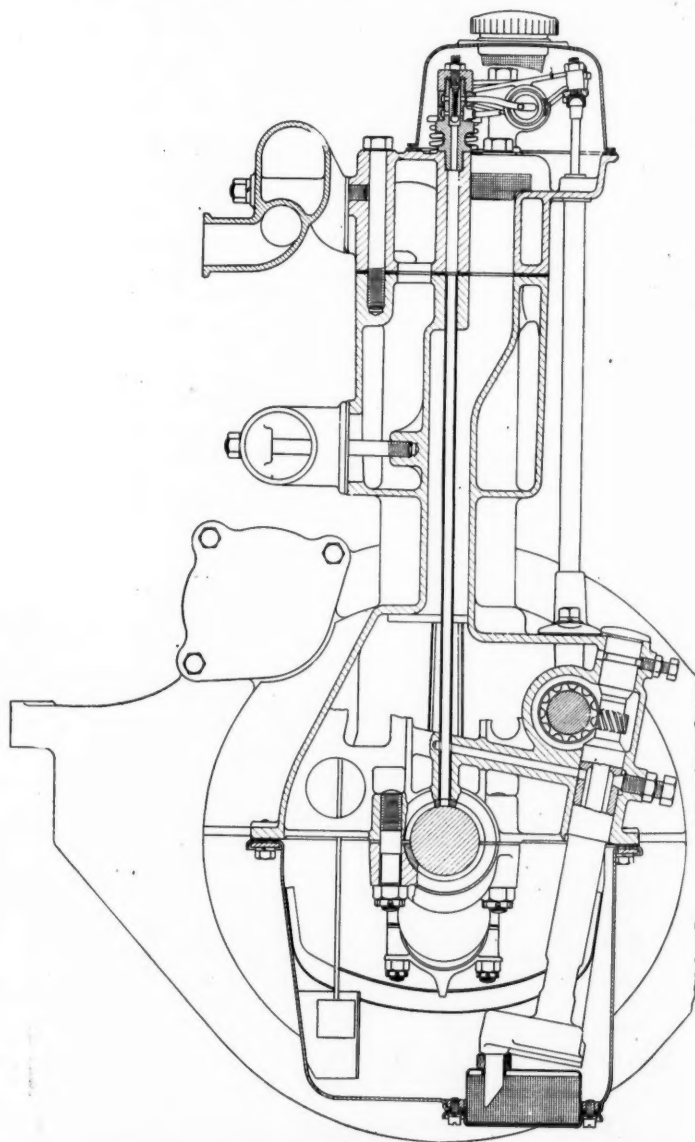
The pistons are also of hard, grey iron, ground to size and heat treated to eliminate internal stresses. They are held within narrow weight limits and are fitted with three piston rings  $\frac{3}{16}$  in. wide, all three being located above the piston pins. These latter are of case hardened steel, ground to size, and are full floating. In production they are inspected with Johansson snap gages and are held to tolerances of 0.0005 in. The scleroscope reading on these pins must be at least 80.

The connecting rods are drop-forgings of I-beam section, heat treated to a tensile strength of more than 100,000 lb. per sq. in. The center-to-center length is 11 in., or 2.2 times the stroke. The connecting rod bearings are 2 in. in diameter by  $1\frac{1}{8}$  in. in length. They are of die-cast babbitt in bronze shells. The bearing caps are held by nickel steel bolts and castellated nuts. Laminated shims are used as spacers between the bearings and caps for adjustment. In manufacture, the connecting rods are balanced against each other, not only as regards their total weights, but also as regards the weight at each end.

Medium carbon steel is utilized in the three-bearing crankshaft. The shaft diameter varies from front to rear, the three bearings being of 2 in.,  $2\frac{1}{6}$  in. and  $2\frac{3}{8}$  in. diameter respectively. The center bearing is as long as the front bearing; that is,  $2\frac{1}{2}$  in., while the rear bearing is  $3\frac{3}{8}$  in. in length. A large oil throw off ring is fitted at the rear, in connection with a special bearing cap construction, to eliminate oil leaks at the rear end. The shaft is put in both rotative and static balance before assembly. One of the features of the shaft is the lightness secured by drilling a  $1\frac{1}{2}$ -in. hole through the crankpins.

The camshaft is also a three-bearing unit with integral cams ground to size. The cam has a spiral angle contour which is said to insure quiet operation in spite of considerable variation in tappet adjustment. The

camshaft runs in cast iron bearings which vary from  $1\frac{13}{16}$  in. diameter at the front to  $1\frac{11}{16}$  in. at the rear. The center bearing of the camshaft is in two sections, between which is a helical gear for driving an oil pump. This gear is cut in the shaft and runs in a pocket of oil. End play of the shaft is taken up by spring pressure acting on a hardened button in the end of the shaft.



Transverse sectional assembly of new Gray-Beall  $3\frac{1}{2}$  by 5 in. overhead valve engine



Each push rod is enclosed in a steel tube connecting the tappet guide with the cylinder head and cap inclosure, thus providing a dust-proof valve mechanism. The valves are operated by rocker arms on a 1-in. hollow rocker shaft mounted overhead. The rocker arms are of forged steel, pack hardened, and the holes in them are ground out. The fit of the rocker arms on the shaft, which is also hardened and ground, is held within 0.0005 in.

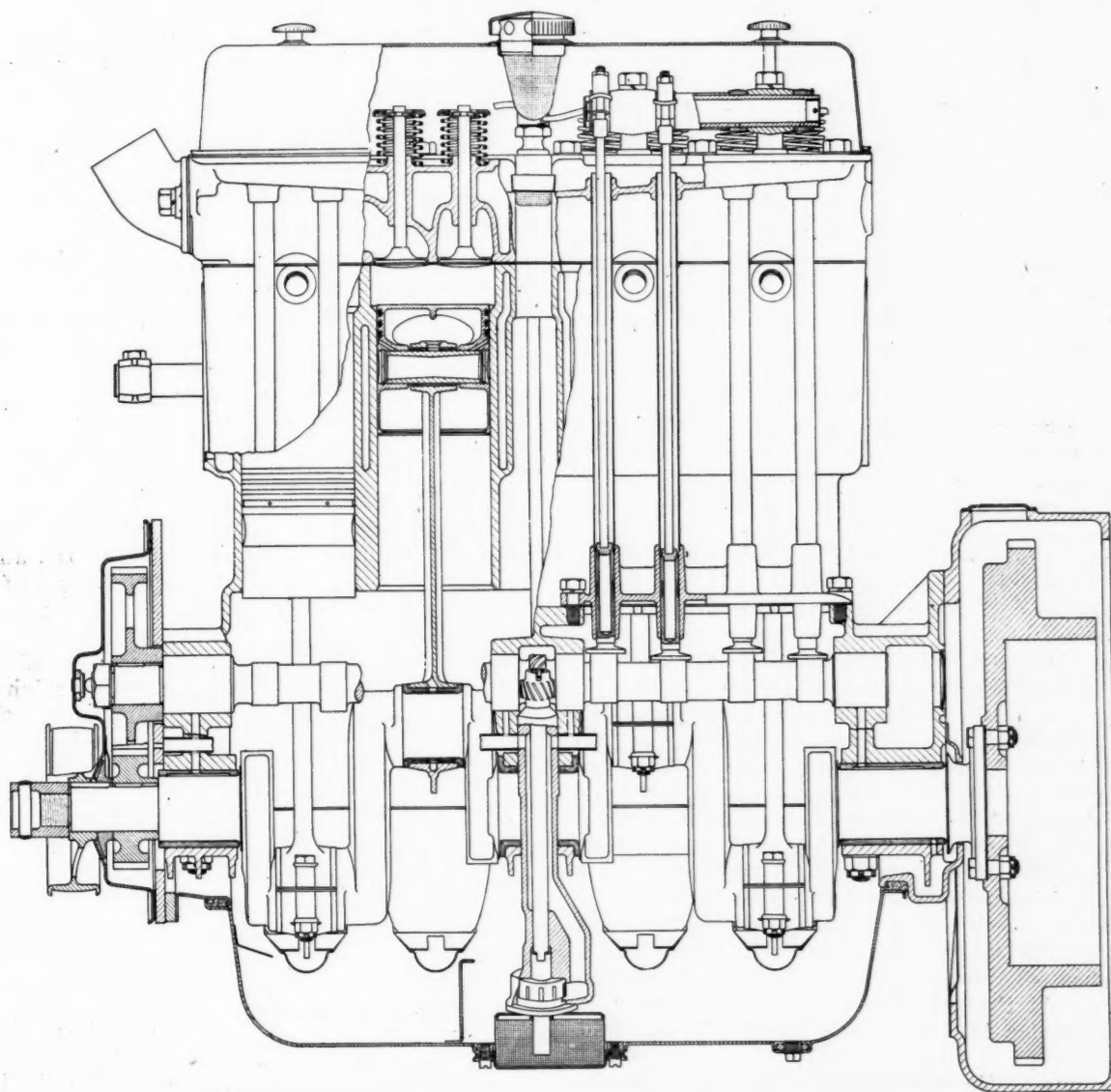
Lubrication is by pressure feed. The oil pump is located in the pan and is supported from the crankcase above by a removable shaft and housing. After passing through the screen and pump, the oil is forced up through the pump shaft housing and is conducted to the crankshaft and camshaft bearings through drilled holes and cast-in steel pipes. There are no copper pipes, or oil connections used at any point. It is not necessary to unfasten or remove any connections to take out the oil pump.

The oil is also forced to the three helical timing gears and to each of the connecting rod troughs in the splash pan. These are of special design, so arranged as to prevent the oil from splashing out laterally and also to keep the trough from emptying itself when the motor is severely jolted while passing over a bump, or running

on an incline. The oil level in these remains constant when the engine is inclined, so that it is possible to install the engine for a straight line drive without interfering with the lubricating system.

In working out the design of the engine with a view to facilitating its use on different chassis, the timing gear cover was so arranged that it may be removed without disturbing the front engine supports. The bell housing is an S. A. E. No. 3. The oil pan can be removed quickly and easily without disturbing the front end supports, and either thermo-syphon or pump water circulation may be had. Ordinarily, thermo-syphon is provided, but provision has been made for the installation of a centrifugal water pump. The oil pump shaft has been extended and a mounting provided in such a way that a governor or distributor can be fitted on the side of the cylinder block without interfering with other accessories.

This engine, known as the Gray-Beall, is named from the combination of the Gray Motor interests with F. S. Beall, formerly vice-president of production at the Packard company. It is this engine which will be incorporated in the car to be produced by this same concern, with which F. L. Klingensmith, formerly vice-president of the Ford Motor Co., has associated himself.



Longitudinal section of new Gray-Beall 3½ by 5 in. overhead valve, rocker arm engine

# French Propaganda Against the Straight Side Tire

Evidently the American tires left in Europe by our army are gaining popularity to an extent that has alarmed the French tire makers, who prefer the clincher type. Here is the protest of the French maker and an answer based upon experience with American tires.

SEVERAL of our French contemporaries, including Omnia and La Vie Automobile, have recently printed articles in which they attempt to convince their readers that the straight side pneumatic tire as manufactured in large numbers in this country, is far inferior to the clincher type of tire, the European standard, and has practically no merits at all. The straight side tire is used in the United States exclusively for all sizes above  $30 \times 3\frac{1}{2}$  ( $31 \times 4$ ) in.

During the war large numbers of American cars with straight side tires were exported to France, and the replacement of these tires alone creates a considerable demand for the straight side type. It seems, moreover, that French users, having become acquainted with the advantages of this tire, are demanding it as regular equipment on new cars. This move is being fought by the French tire industry. As it is well for our tire makers (who believe in the straight side tire) to know what arguments are being put forth against it abroad, we reproduce below the article of La Vie Automobile in translation. The original article was appended to one describing the Michelin cable tire, thus revealing the evident source of inspiration.

By Charles Faroux

ALL of the pneumatic tires employed in France for a long time have been of the soft bead or clincher type. As every one knows, they are mounted on a rim having on each side a sort of internal clincher in which the round portion of the bead engages. Placing a clincher tire on a rim is made a very easy matter by the use of suitable levers.

In America use is made chiefly of so-called straight side tires, or hoop tires. The covers have no projecting beads. Near the edge of the covers a metallic core is embedded in the bead, thus preventing the diameter of the cover on the bead side from varying one way or the other. The rims which go with these tires comprise two flanges which may be made independent of the rim.

Mounting of the tire on the rim is possible only if the rim is detachable. In the systems in most common use one of the flanges may be detached from the rim; the flange which was removed is then replaced and is secured in position by means of a locking system.

This American system was almost unknown to us before the war, but the throwing onto the market of a larger number of American vehicles made it known in our country. At the present time a large number of vehicles in service in France are fitted with straight side tires.

Thus the pneumatic tire situation has been complicated, for to the single system formerly in use there has been added an entirely different system, which com-

pels dealers to carry a double stock in order to be able to meet all demands.

Is this complication justified by any superiority of the American system? Not at all—quite the contrary. The two kinds of tires do not differ one from the other except by their methods of fastening; outside of the beads they are exactly alike in construction, and provided workmanship and material are the same, the American and European tire are equivalent. There remains the question of the fastening means.

The European method is simplicity itself, as already pointed out; with it there is no need for a complicated equipment for putting on the tire. Besides, the single piece rim is inexpensive and substantial.

On the contrary, the American tire absolutely requires either a detachable rim or else a rim which contracts temporarily while the tire is passed over its flange.

## Disadvantages of the Straight-Side Tire

Straight-side tires entail the use of a relatively complicated rim, which necessarily increases the weight of the wheel at the rim and, consequently, its moment of inertia.

The farther away from the axis the weight of the wheel is located the longer will be the lever arm which moves the weight in its rotation, and the greater the effort required to get it up to speed. Inversely, the greater the amount of energy stored up in the wheel once it has been brought up to speed, the more violent must be the braking action, and the disadvantages of a road wheel acting as a flywheel are well known; it is these disadvantages which have led to the almost complete abandonment of the numerous designs of demountable rim, which apparently are more attractive than the demountable wheel.

It is easy to measure the power required to start a wheel when fitted with a clincher and straight side tire respectively.

Experiments made by Michelin were conducted with two wheels identical up to the tires, in which the difference in weight at the circumference amounted to 23.43 lb.

## Account of Test

The tire loaded with a weight P of 1100 lb. is carried at the end of a lever arm B. It

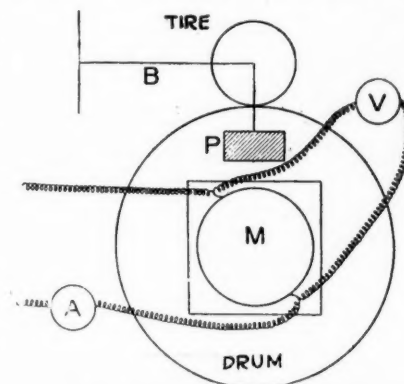


Fig. 1—Machine for testing tires as regards rolling resistance



rests on the surface of a drum which turns at a peripheral speed of 30 m.p.h. The drum is driven by an electric motor M. It is possible to measure the power absorbed by the motor by means of a voltmeter V and an ammeter A. The tire is first raised in such a manner that it does not touch the drum on which it bears. On the voltmeter and ammeter are read off the power consumptions corresponding

to starting and normal running. Chronometer readings are taken of the time elapsing before the starting point and the normal speed are attained.

The results of the experiment are plotted graphically in Fig. 2.

1—On starting the straight side wheel takes 426 watts more than the clincher wheel. This is more than  $\frac{1}{2}$  hp. and is enormous (1 hp. = 746 watts).

2—The normal speed is attained by the clincher tire at the end of 3 m. 9 s., and by the straight side tire at the end of 6 m.

3—At normal speed the straight side tire takes 100 watts (1/7 hp.) more than the clincher.

The phenomena observed at the moment of starting are reproduced, in an inverse sense, when the brakes are applied. The figures cited above refer to one wheel; the car has four of them; therefore, these figures must be multiplied by four in order to get an idea of what is going on on a vehicle. The phenomena above described take place not only on starting and braking but at every acceleration and deceleration, with reduced force.

#### Mechanism in the Mud

Aside from the disadvantage due to the greater inertia of the straight sided tire, there are disadvantages of a practical nature in connection with the mechanism. The rim of a wheel is extremely close to the ground, and, consequently, whatever you do, this rim is constantly covered with mud. The result is that all parts not protected by paint are quickly rusted. Now, the mechanical parts which hold the removable flange of the American rim in place—studs, nuts, lugs—are necessarily rusted, as it would be impossible to cover the threads of the nuts, for instance, with paint. As a new tire fitted to a wheel may remain in place for months, the difficulties encountered in trying to operate this rusty hardware, after having been in use for three months during the winter, in the mud of the suburbs, may readily be imagined. Every thing is locked and frozen by rust, and it is necessary to develop superhuman efforts to separate the parts from each other.

The tire dismounted, we are not at the end of our trouble, as it is necessary to fit a new cover to a rim completely covered with rust; if it should happen that the removable flange of the rim be slightly distorted, which is almost certain to be the case if it had to be removed with hammer blows, we can readily imagine all the fun which we will have in performing this operation.

Americans having the reputation of being practical people—a reputation sometimes ill deserved (see the kind of order that obtains in the heaps of merchandise in the

American camps)—how is it that this extremely practical people continue to make use of such an unhandy tire?

Simply for the reason that automobiles are not used in the same way in America as in Europe. An American who has had a break-down never occupies himself, so to speak, with his car. If it balks he leaves it where it is, at the side of the road, and telephones to the nearest garage. The repairman arrives, takes the disabled car in tow, if necessary, hauls it to his shop and makes the repair.

This is the mode of procedure which is applied as well in the case of a tire blow-out as in that of a broken rear axle. The shops, consequently, are well equipped to do any kind of repairs. It is readily conceived that with an elaborate equipment the replacement of a tire, however defective its method of mounting may be, does not require much time. In any case, the owner of the car never soils his hands, and, consequently, he does not suffer from the disadvantages which the system presents.

On the other hand, it must not be believed that all Americans ride on straight side tires. In the cities, it is true, these tires are being used, but in the country, where the farmers use their Ford or similar vehicle in their daily work, these vehicles have wheels fitted with good old clincher tires, exactly the same as European tires.

Let us, therefore, not complicate the task of our manufacturers, to our own great detriment, by compelling them to carry two complete series of tire models. In the final analysis it is your own pocketbook which carries the burden of this complication.

The European tire has proven itself clearly superior to the American tire; let us stick to it and if the hazards of the liquidation of stocks have brought us into possession of a vehicle with straight side tires, let us not hesitate on the first occasion to have the special rims—however complicated and ingenious they may be—replaced by good old clincher rims, which will enable us to find tire replacements at the store of the nearest dealer.

## Advantages and Safety of the Straight Side Tire

By P. M. Heldt

WE must first inform our confrère that he is very much mistaken as to the conditions under which cars are used in the United States. That they were used mainly in the cities may have been true twenty years ago, but we have moved ahead somewhat since the beginning of the century, in road construction as well as in automobile manufacture. There are now close to nine million automobiles in service in this country and we do not believe that our manufacturers would ever have succeeded in finding purchasers for so many if the owners did not have sufficient confidence in their cars and in themselves to drive more than a few miles away from a garage. That it is the common practice of American motorists, when suffering from a flat tire, to call up a garage is absurd.

Of course, we prefer to do our tire mending at home or in the garage to doing it on the road, and for that reason we carry demountable rims, but we fully believe that French motorists also prefer to do their tinkering at home at their leisure. That Americans are poor mechanics, as stated by Omnia, is untrue. It does not require any high degree of mechanical skill to operate an ordinary detachable rim, and the average American

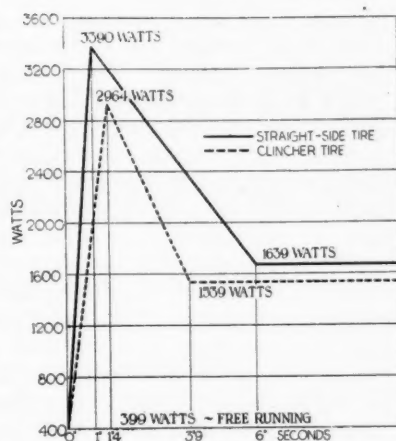


Fig. 2—Rolling resistance as measured by the machine shown in Fig. 1

is fully capable of removing either a straight side tire or a clincher tire. The American farmer, particularly, is probably more self-reliant and capable in mechanical matters than any class of European motorists except those with machine shop training.

The difficulty of applying and removing straight side tires is greatly exaggerated. Sometimes, if a tire has been in place on the rim continuously for a year or more, it may be rusted on and, therefore, hard to dislodge, but this is so whether the tire is a straight side or clincher type. This is naturally a rare occurrence. Ordinarily, after the straight side tire has been on the wheel for some time, it slides right off the wheel and on again and it is incomparably easier to handle than the clincher tire.

There are a number of positive advantages in the straight side tire, without which it would never have been made the standard of the American tire industry. First comes the factor of safety. It is obvious that in case of a sudden deflation a tire with a non-extensible bead (straight side) cannot be wrenched from the rim so easily as a flexible bead tire (clincher). The danger resultant upon shedding a tire when going at high speed is well known.

Another important advantage of the straight side tire is its greater immunity from damage when run under-inflated. The edges of the rim of a clincher tire have a tendency to gouge into the tire when the pressure of inflation is suddenly released. In the straight-side tire, where the edges of the rim flanges flare outwardly, there is no such tendency, and rim cutting is, therefore, practically eliminated. Under-inflation is the abuse which is responsible for many cases of unsatisfactory tire service, and it is far less injurious to the straight side than to the clincher tire.

Observations of tires of otherwise substantially equal construction but with straight sides and clincher beads, respectively, have shown the former to be substantially longer lived. S. P. Thacher, technical assistant to the president of the United States Rubber Company, says on this point:

"In studying the reasons for this difference, we have come to the conclusion that they lie in the better structural arrangement of the plies of fabric or cord at and above the bead proper and in the larger volume of air carried by the straight-side type. These are the basic

reasons, and they explain the margin in favor of the straight-side when tires of both types go through a road test without injury. The margin becomes still greater if the tires are run flat even the minimum distance required to stop the car after a puncture or cut has occurred. Under these conditions the deflated straight-side tire lies naturally over the out-turned flanges of the rim without injury, while the inturred flanges of the clincher rim cut and chafe many miles out of the clincher tire."

The superiority of the straight-side over the clincher type of construction is emphasized by its use in the giant truck tires. It is the firm conviction of our tire makers that tires of 8 in. and greater width would be impossible with clincher beads, as the tire would not have the required support on the rim, causing a certain lateral instability of the vehicle.

The reference to "rusted hardware" is hardly calculated to strengthen the argument of our French contemporaries. A clincher rim is no less "hardware" than the detachable rim and just as likely to rust. Such catch phrases prove nothing. We remember M. Michelin using the same mode of attack against rubber non-skid treads which he referred to as "sculptured tires," but this did not prevent the success of these treads.

The best answer to the French allegation that the straight-side tire is a makeshift which can be changed conveniently only at a garage furnished with elaborate equipment, is that there are hundreds of thousands of motorists in this country successfully using straight-side tires who never think of going to a garage or tire station to replace their tires. American tire manufacturers are not ignorant of the features of the clincher tire, as they have produced many times more such tires than European tire makers. The straight-side tire is based on the old Dunlop bicycle tire which had steel cables in its retaining edges to make them inextensible. American manufacturers supplied the detachable rim and combined it with the inextensible edged tire. This combination has become the standard of this country for all except the smallest size of automobile tire. According to late information, it has been placed in production by at least one British and one French firm, and we feel quite sure that if we ever come down to a single universal standard for pneumatic tires for automobiles it will be the straight-side tire.

## Why the French Automobile Production Program Failed

(Continued from page 691)

of new trucks is even more difficult than the sale of passenger cars. French manufacturers feel that they have been made to suffer unnecessary hardships by these Government sales, and there is no doubt that there is a large element of truth in their contention. The sale of these army stocks has been woefully mismanaged, but this, of course, is not any consolation to the manufacturers who find themselves obliged to cut their production 75 per cent.

Dealers who have attempted to get on the French market with American cars and automobiles have not had a happy experience. For a long time imports were prohibited; then a 70 per cent duty; then, to make matters worse, exchange rates rose from 8 francs to the dollar to 17 to the dollar, to fall to the present comparatively high rate of 14 to the dollar. As a consequence, the sale of American passenger cars on the French market is now at a standstill, and the numerous dealers who got into this line at the armistice, as the result of the experience they had had during the war with American cars, have

either been forced out or, if they possess the means, are waiting for an improvement in the future.

Ford has a rather special position and has remained on the market, for, although the price increased from 10,500 francs at the armistice to more than 20,000 francs, falling to the present price of 13,900, this car has continued to undersell French makes. Last year Ford suffered as much from the general depression as any others, the volume of business in 1920 being lowest on record.

For a time the tire field looked very promising, but even here immense sums have been lost. Up to the middle of last year the tire factories were unable to meet demand and American makes were sold readily. Firestone, U. S., Oldfield, Ajax, Fisk, Braender were some of the makes unknown here before the war which got on the market, either directly or through dealers. When the slump came many of the individual dealers found themselves with large stocks and had to sell out at very heavy losses. These deals have temporarily demoralized the French tire market.



# New High-Grade British Chassis Is Designed for Production

Is equipped with four cylinder  $3\frac{3}{8}$  x 5-5/16 in. engine developing 40 h.p. at 2000 r.p.m. Overhead valves and detachable head are employed. Aluminum cone clutch without facing runs in oil. Clutch and gearset are easily dismantled for repair. Cantilever springs are mounted inside frame. American and British practice combined in design.

By M. W. Bourdon

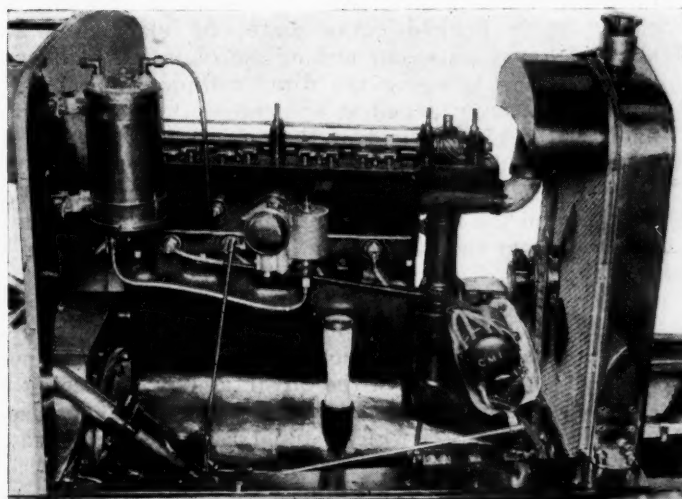
**T**HE criticism leveled, generally with good reason, against British chassis designs of all sizes and prices, i.e., that production costs are given insufficient consideration, cannot be applied to the new 18 hp. Phoenix. True, there are points where further economy is possible, as might be expected in a first attempt to design a chassis which shall be economical to produce and at the same time comply to the full with British standards in respect to efficiency, smoothness of running and ease of upkeep. This new model is not put forward as a cheap car, but as one of high-grade designed to make and sell at a reasonable figure; it is attracting the keen attention of a number of British manufacturers, who are only now coming to realize that economical production is absolutely essential to future success and that it can be attained without sacrificing ideals in other directions.

It is a subject for remark that Phoenix should be the first British manufacturer to make radical departures in order to reduce manufacturing costs while increasing engine efficiency, and that, too, in a chassis of medium power, for this maker has not in the past been renowned for up-to-dateness in design—even on British standards. The plant is modern, but Phoenix design has hitherto been more in accord with the length of time the firm has been in the industry—nearly twenty years. Further, the

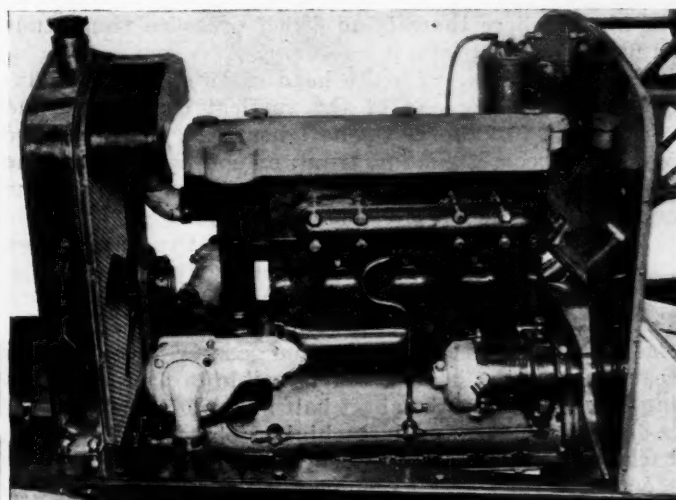
largest car yet made has been a 12 hp. with three seats abreast.

The new model, which sells at \$3,200 with five-passenger body, has a four-cylinder block cast engine with overhead camshaft, valves in line and a detachable head. Bore and stroke are 85 x 135 mm. ( $3\frac{3}{8}$  x 5 5/16 in.) and a power output of 22 hp. at 1,000 r.p.m. is claimed, and 40 b.hp. at 2,000 r.p.m. The camshaft is carried by four plain bearings, one at the rear, one central and two at the front—one of the latter at each side of the helical driving gear, which has a ball thrust. Camshaft bearings are lubricated by pressure through an exterior pipe leading direct from the pump to a union on the side of the cylinder head and thence by an internal duct to the central bearing; a small bore pipe runs from the latter to the end bearings with spray jets on to the cams and rockers.

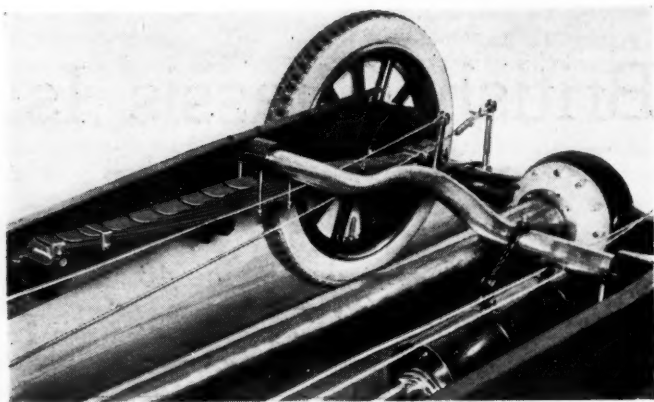
A feature is the design of the rockers, each of which may roughly be likened to a long link from a roller chain, with one end roller internal to form a bush and a third roller to which the cams apply offset between the two end ones. At present the rocker is built up of steel side plates, hardened steel pins and two hardened steel rollers, a bronze bush forming the pivot bearing; and here is an opening for economy in production which could probably be made use of by getting a detail on



Right side of new 18-hp. Phoenix engine. Overhead camshaft has four bearings and is driven by helical gears. Magneto ignition is used. Note recesses for nuts on inverted holding-down studs



Left side of Phoenix engine, showing water pump bolted to facing on block casting of crankcase and cylinders. Cored passages make hose connections between engine and pump unnecessary



*Cantilever springs on new Phoenix chassis are located inside the frame. Trunnion bearing at center has oil-less bushing bearing upon the tubular cross member of the frame. Ends of springs have sliding contact on axle and frame bracket. Side member of frame is cut off short to give clearance to brake drum on wheel*

the same principle made by a roller chain maker. The rockers are mounted in pairs and pivot at the ends opposite to the valves on short shafts in separate brackets attached to the top of the head. Thus low cams are used with the lift increased in the actual valve opening.

Valve clearance is adjusted by a cap screwing on to the threaded valve stem and locked by coned contact between it and the spring plate, the latter having a dowel which fits into a groove in the valve stem to prevent it from turning during the process of adjustment. There is scope for economy here also since it appears that but for the advantage of roller contact between rocker and valve—which is certainly worth considering—no benefit arises from this arrangement.

The cylinder head is held to the block by inverted studs  $\frac{1}{2}$  in. diameter and nuts; 5 on each side pass through the top of the block, the latter having exterior recesses for the nuts. The elimination of central studs is an innovation—in England at all events—and has two advantages (1) increased area gasket contact faces around the cylinder bores and (2) shorter studs of larger diameter. It is an arrangement which also simplifies the appearance if not the machining of the head in overhead camshaft designs. But obviously special precautions are needed to prevent distortion allowing leakage of water or compression at or about the longitudinal center line of the block, where there is no direct pressure from studs as usual.

Formed integral with the head casting is a trunk enclosing the upper end of the vertical drive-shaft and carrying two of the drive-shaft bearings, the other two being in a corresponding trunk extending up from the distribution casing and integral with the latter and the cylinder and crankcase block.

To enable the head to be removed and the valves taken out without disturbing the camshaft drive, the vertical shaft has a sleeve coupling secured to the lower half. Tongues on the shaft ends engage with slots in the sleeve and are offset from the shaft center line so that in reassembling the head it is impossible to upset the timing by coupling up the shaft half a revolution out. This is claimed to be a simple machining job without allowing backlash to occur, but in the writer's opinion there is scope here for a small economy in the manner in which an undoubtedly excellent idea is carried out.

Magneto ignition is fitted, although the original intention was to use a dynamo battery system. The magneto has displaced the dynamo and the latter is therefore

belt drawn, but by a separate belt from that driving the fan.

The top half of the crankcase is integral with the cylinder block and the housing of the cross-shaft for water pump and magneto drives. Three journal bearings support the crankshaft in the upper half of the crankcase, and these are fitted with die-cast liners of the same size as and interchangeable with those of the connecting rod big-ends.

Cast-iron pistons with three compression rings are used. The piston body is peculiar in that it is recessed and lightened by coring between the lower ring and the skirt. Hollow wrist pins float in the piston bosses, but are fixed in the small ends of the H-section connecting rods by a draw bolt engaging a shallow groove at the center of the pin. Three oil holes run from the bottom edge of the lower ring groove at each side to the interior of the unbushed piston bosses.

Pump water circulation is used. The pump casing has a self-adjusting gland and is bolted to the cylinder block with a cored passage to the water jackets, thus avoiding the need for separate pipes or connections between the two. Special precautions are taken to prevent water leaking into the crankcase, there being a drain hole in the pump shaft casing and a reverse groove in the cross-shaft bushing. The honeycomb radiator, in this model normally located, instead of being at the front of the dashboard as in the older models, has its shell and core separate, the latter being supported inside the steel shell at three points on rubber cushions.

Engine lubrication is maintained by a modified trough system, for although troughs are used under the big ends, the oil is carried by direct exterior leads to the main journal bearings and to the overhead camshaft. The excess of oil fed to the camshaft lubricates the vertical and cross-shaft bearings and gears in returning to the crankcase. The oil pump is driven by a lower extension of the vertical driveshaft for the overhead valve gear.

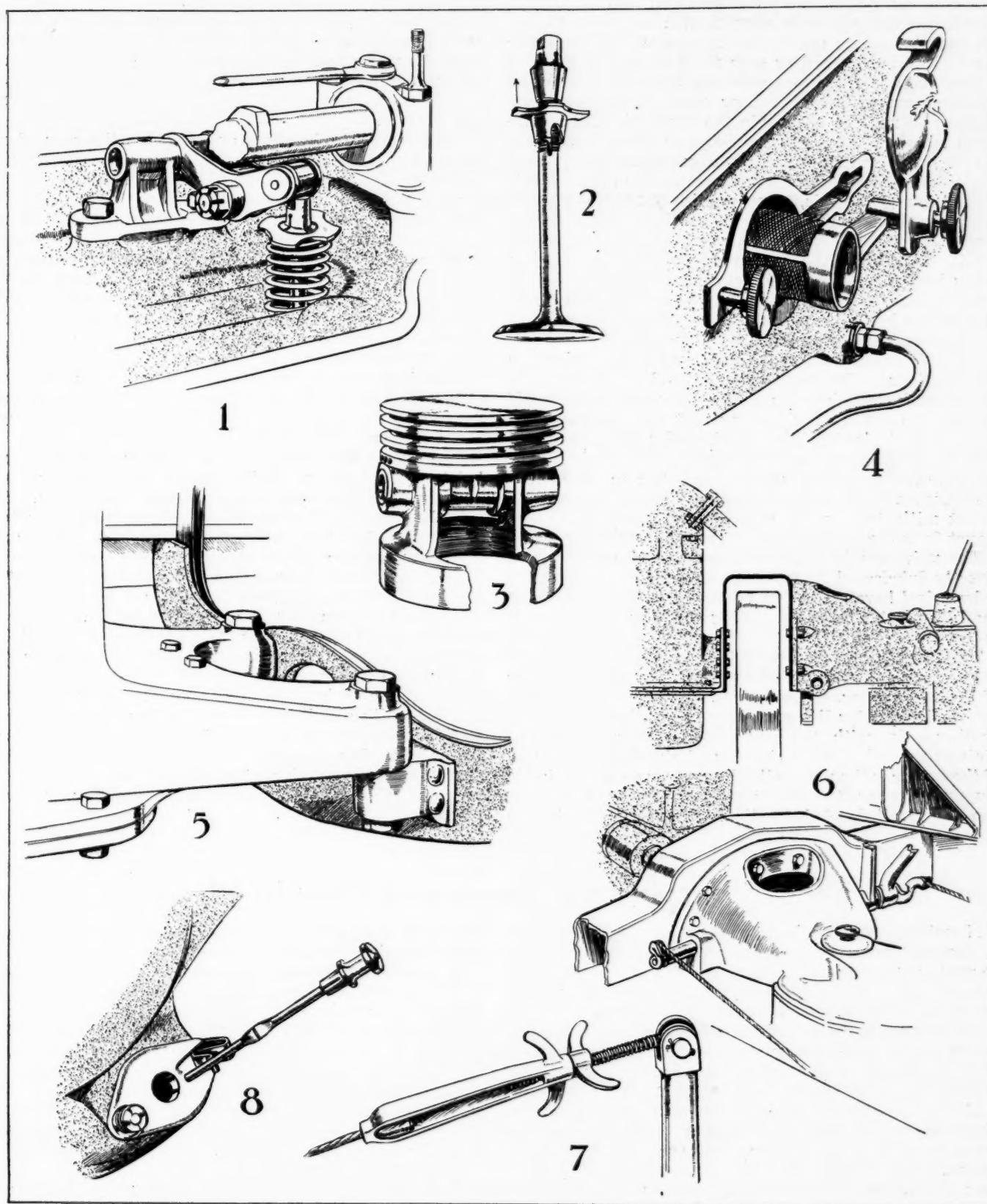
Another special feature lies in the mounting of the oil filter, located at the bottom of the sump. It is a cylinder of gauze with its inner end closed and its open outer end making contact with the inner wall of the sump opposite a hole from the outside of which the oil suction pipe leads to the pump. Although the filter is submerged, it can be withdrawn in five seconds for cleaning without draining the oil. An inch or so above the high level of the oil is a round hole in the sump wall with a slot extending from one side, the opening being normally enclosed by a flanged cover plate; by slackening two knurled finger nuts, one end of the plate can be swung upward, thus bringing the filter cylinder opposite the hole. An arm, attached at one end to the bolt which is fixed in the pivoted end of the cover plate, carries the filter attached at the other end, as will be seen from the cut. When the filter arrives at this point, its arm or bracket and the cover plate can be withdrawn as a unit, the slot from the side of the hole allowing the arm to pass through.

While this filter arrangement is more costly than a cylinder of gauze with a flanged outer end bolted over the outlet hole to the suction pipe, it overcomes, without great expense, and with the advantage of still being on the suction side of the pump, the great objection of users to submerged filters which cannot readily be cleaned or inspected.

Engine and gearset are not truly a unit, for they are separately bolted to the front and back, respectively, of an inverted channel section crossmember of the frame. This is a deep bridge-like pressing, which half encircles the flywheel located within the channel. The arrange-



## Details of Parts of New Phoenix Chassis



(1) Overhead camshaft and valve gear. (2) Combined spring anchorage and clearance adjustment on threaded valve stem. (3) Lantern type cast iron piston. Note oil holes for lubricating piston pin. (4) Oil filter partly removed. It is easily taken out for cleaning without draining oil from sump. (5) Front engine brackets bolted to cross member of frame. (6) Two views showing method of mounting engine and gearset. They are both attached to the channel section pressed steel cross member, thus forming what is in effect a unit powerplant. (7) Brake cable adjustment and locking device. (8) Oil filler and level gage on rear axle

ment allows either the engine or the gearset to be detached independently of the other, and yet has most of the advantages of unit construction. The clutch pit is inverted, being open below and enclosed above, though a hole in the top (which is integral with the upper half of the gearset casing) allows the clutch coupling and striking fork to be reached or seen from above.

The clutch is of the cone type, the driven member being of aluminum without fabric or other facing; it is enclosed and runs in oil within the flywheel, with a ball-bearing pilot. The aluminum-to-iron cone clutch has been a successful feature of Phoenix cars for many years past. Between clutchshaft and gearset is a single fabric disk coupling and this, together with the open-bottomed pit, allows the clutch as a unit to be dismantled and lowered clear in five minutes without disturbing any other detail. Similarly, the lower half of the gear-casing, being held up to the top by six bolts and nuts, can be lowered independently, bringing the layshaft with it and also bottom half of spherical housing of torque tube.

Three speeds are provided with central control lever, the six-spline shafts and the pilot end being carried on ball-bearings. The gear-casing is divided horizontally on the mainshaft bearing center line; the bottom half forms the housings for the layshaft and reverse shaft bearings and also half the housings for main shaft and torque ball at the end of the propeller shaft casing. The gearset overhangs from the crossmember, to which it is bolted, more than seems advisable, and this shortcoming is not mitigated by the fact that it takes torque and thrust from the propeller shaft casing.

The universal joint is of the plain bushed star type, directly lubricated from the gear-casing. Final drive is by spiral bevel, with the pinion formed solid with its shaft, the latter having a sliding coupling connecting it to the propeller shaft.

Two steel pressings welded together form the tapered torque tube, which is bolted to the aluminum front cover of the axle center. Steel pressings welded together on the vertical center line also form the casing of the full floating axle, with the differential, crown bevel and pinion mounted on a front cover of aluminum. At rear of the center is the usual oil-filling elbow on a detachable aluminum cover, the elbow cap embodying a bayonet gauge for oil level indication. The axle shafts are

splined at each end and convey the drive through dog clutches to the pressed steel hubs which are mounted on Timken bearings. The front hubs are also steel pressings and run on Timken bearings.

All steering joints, spring shackles, clutch and brake-shaft bearings have oil-less bushings. The steering gear is of the worm and full worm wheel type with axial adjustment for the worm shaft, the housing being bolted to the front face of the crossmember between engine and gearset.

Both sets of brake shoes apply within the rear wheel drums, and are actuated by steel cable connections with adjustment at the rear ends. Full cantilever springs, 49 ins. long, are located inside the frame, are used at the rear, and semi-elliptics, 36 ins. in length, at the front. The cantilevers are pivoted with oil-less bushes on a tubular crossmember. Their front ends slide within pivoted brackets and rear ends slide within a fixed bracket on the rear axle, the sliding surface being lubricated from an oil well. The wheels are of the detachable pressed steel and hollow spoked pattern, with 815 x 105 m.m. tires (32 x 4 ins.).

Fuel is fed by vacuum from a 15-gal. tank arranged longitudinally inside the frame. A large filling spout, containing a combined filter and gauge, projects through the right-hand step-board.

The standard body is a five-passenger open type, upholstered in leather. This has the usual one-man top and divided windscreen with swinging upper panel. Beside the usual equipment, which includes a speedometer, spare wheel and tire, luggage-carrier and electric horn, a folding tonneau screen is provided, an item which is for the first time included in the standard price of a British car—and, so far as the writer is aware, in that of any car, irrespective of country or origin. But it is an item which many people maintain is as essential for completeness of equipment as is a front screen for the driver and his companion.

One of the designers of this new chassis is a man at one time with a British automobile firm whose cars are world-famed. He has lived temporarily in the United States, studying American production methods, which fact justifies the opinion of observers that American and British brains have collaborated in evolving the new Phoenix.

## Effect of Varying the Number of Plies in Plywood

**I**N making up plywood for a particular use the question frequently arises, Should three plies or more than three be used to obtain the required thickness? Some data from tests by the U. S. Forest Products Laboratory may be of assistance in answering this question.

An increase in the number of plies results in a decrease in the tensile and bending strength parallel to the grain of the faces and an increase in the corresponding strength at right angles to the grain of the faces.

If the same bending or tensile strength is desired in two directions, parallel and perpendicular to the grain of the faces, the greater the number of plies the more nearly the desired result is obtained. It must be borne in mind, however, that plywood with a large number of plies, while stronger at right angles to the grain of the faces, cannot be so strong parallel to the grain of the faces as three-ply wood, and hence a three-ply panel is preferable where greater strength is desired in one direction than in the other.

Where great resistance to splitting is necessary, as in plywood that is fastened along the edges with screws and

bolts and is subjected to forces through the fastenings, a large number of plies affords a better fastening.

It is common experience that a glued joint is more likely to fail when thick laminations are glued with the grain crossed than when thin laminations are glued. The same weakness exists in plywood when thick plies are glued together. When plywood is subject to moisture changes, stresses in the glued joint due to shrinkage are greater for the thick plies than for the thin plies. Hence in plywood constructed with many thin plies the glued joints will not be so likely to fail as in plywood constructed with a smaller number of thick plies.

**I**T is reported from Christiania that the North Electro-Kemisk Aktieselskab, the works of which are at Tysse, has been experimenting with a special ferro-chrome alloy, produced electrically, which will not rust and which is not affected by most acids. The process of production is said to be so cheap that the new steel will not cost more than other kinds. The company, it is said, contemplates the establishment of works for the production of this steel.



# A Flexible Frame Truck Designed for Use on Poor Roads

Two and one-half ton job intended primarily for use in oil fields. Individual units protected against damage by frame distortion. Ample reserve power, unusual road clearance, and giant pneumatic tires featured.

ONE of the severest classes of service to which motor trucks are put is that in the oil fields. All of the material necessary for putting down a well, from the lumber for the derrick to the fuel required for the boiler, must be transported from the nearest railroad to the well location. This material varies in size and bulk from light hand tools to a boiler weighing more than 10 tons, the latter being used for generating steam to drive the drilling machinery.

When a well is once started, all of the material required must be delivered in an uninterrupted stream, for a delay may mean great loss. Where there are a number of wells going down in a field, the first well brought in has the biggest flow; each additional well put down weakens the flow of the others tapping the same pool. Therefore, if a well is brought in 10 days before its neighbors, and develops a flow of 2000 barrels, it will have a total flow of 20,000 barrels more than any of the others in the same field. At \$3.00 per barrel, this represents a clear gain of \$60,000. For this reason a well when once started is rushed through to completion as quickly as possible. Work is carried on night and day, no delay of any sort being tolerated. It is not unusual to pay as much as \$200 for transporting a much needed load of oil well material over 10 miles of a particularly bad road during the rainy season.

Trucks designed for use mainly in the cities have been found unsuited for this work, owing to insufficient reserve power, insufficient frame strength and flexibility, and insufficient road clearance. Practically all oil field transportation is done with 2½-ton and 3½-ton trucks with 3-ton two-wheel trailers, the majority of the material hauled, such as lumber, boilers, drill tools, and casing, being too long and heavy to be carried on the long wheelbase truck. For operation over soft roads, both truck and trailer are equipped with giant pneumatics, as they give better traction and do not cut in as deep as solids.

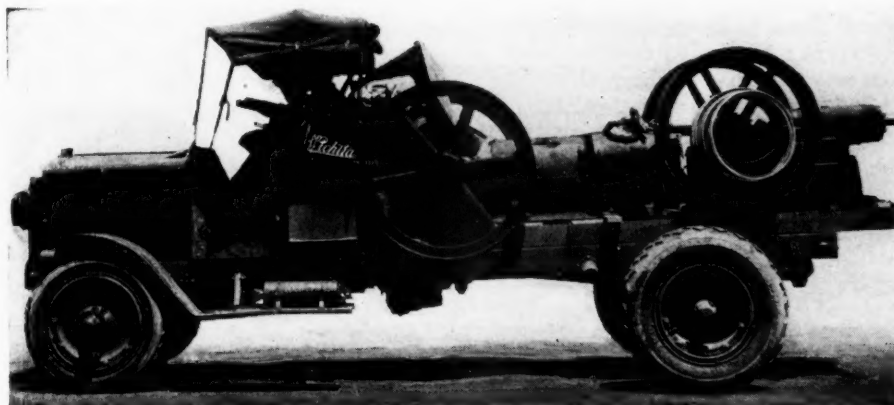
A special study of the transportation requirements of oil well operators has been made by the Wichita Motors Co., whose plant is located in the center of the oil field district. They began by making changes and alterations on their standard 2½-ton model and after thorough tests under working conditions, built some other trucks in which the weaknesses of those previously tried were eliminated. The final result was a specially designed 2½-ton truck, known as the RX Oil Field Special. The particular features of this truck are giant pneumatic tires, ample road clearance, a form of construction whereby the individual units are protected against damage from twisting and distortion of the frame, heavy sectional flexible frame and ample reserve power.

The greatest problem was to obtain the proper balance between motor size, transmission and rear axle reductions, and rear wheel diameter in order to obtain an ability that would not put too much of an overload on the worm axle and transmission, and still give sufficient tractive effort and road clearance to pull through bad places with a heavy load on truck and trailer. Frame breakage was another problem. Some of the frames on the first experimental models were fractured at three different points at once after only four weeks of service, in spite of the fact that they were reinforced with a ¾-in. truss rod. These fractures always occurred at a point in the channel where a rigid cross member or bracket was attached. It was not due to overloading, but to the constant twisting and distortion, due to the numerous chuck holes in the road, and as the cross members and brackets localized all these twists and distortions on the side channel, it was only a matter of time before fracture occurred, regardless of the section of the channel.

The frame now used is of the flexible type of pressed steel having channels 7 in. deep of 5/16 in. alloy steel stock. It is free to deflect and distort for practically its full length, there being only two rigid cross members, one at the rear ends of the rear springs, and the other close to the fly-wheel, the latter being used for supporting the pedals and control levers.

Bad effects due to extreme distortion are eliminated by making the radiator, hood, floor board and dash, and seat box, each a separate unit, having no connection to its adjacent units. This permits the whole front end to weave without straining or loosening any of these units. Three point suspension is used for the power-plant, which is a four-cylinder, 4¼ x 6 in. valve-in-head, detachable head type.

In order to insure perfect vaporization of the fuel used the entire intake



Wichita Oil Field Special with typical load

manifold is surrounded by hot exhaust gases so that the entering charge is certain to get sufficient heat to properly vaporize low-grade fuels. Connecting rod bearings can be inspected and adjusted through hand holes in the side of the crankcase. Ignition is by means of a single high tension magneto. Frictionless, elastic fabric universal joints are used throughout, as they require no attention or lubrication, and are impervious to oil and water. The engine is governed by a Duplex governor; the clutch is a cone type, leather lined, 15 $\frac{3}{4}$  in. in diameter, and is preferred because of its simplicity and ease of adjustment. The transmission, located amidships, is a four-speed direct on fourth, with pump aperture for attaching an air pump for pneumatic tires, and is suspended in the frame at three points. Hotchkiss drive is used. The rear axle is worm driven. Both brakes are internals, 2 $\frac{1}{4}$  x 18 in. in dimensions, and located at the rear wheels. The wheels are of steel, spoke type for solid tires, and disk type for pneumatics. The tire dimensions in the case of solids are 36 x 4 front, 36 x 8 rear; in the case of pneumatics, 36 x 6 front, 42 x 9 rear. The wheel-base is 160 in., but can also be made 135 in. The total

weight of the chassis is 5900 pounds. A power or hand winch can be supplied as extra equipment, to be used for loading or pulling the truck out of a mudhole.

Besides the work for which it was specially built, the RX model has been found to be well adapted also for high altitude work around mines and in South American countries, such as Peru, Chile, and Bolivia, where in many instances trucks are required to start with a full load at a seaport and climb to some inland town at an altitude of 10,000 to 15,000 ft. The usual procedure for high altitude operation is to increase the compression. This is quite satisfactory if the truck is to remain at high altitudes, but if its duties require it to descend, the engine knocks, and generally performs badly. The Wichita RX Oil Field Special is said to have a sufficient reserve of power to take care of the loss due to altitude. There are now twenty-seven of these Oil Field Specials in operation in South America, and all are working at altitudes over 10,000 feet. Other lines of industry in which the transportation requirements are similar to those in the oil fields are the lumber industry and sugar beet farming and the Model RX truck has also found application in these fields.

## An Automobile for Operating Over Snow

A HIGHLY successful automobile for operating over snow and ice was revealed at the French competition for motor sleighs. The machine is the invention of the French engineer Keggresse. The Keggresse invention is of the self-track laying type, but instead of an all-metal track use is made of a molded rubber band with a canvas base.

On the Citroens entered in the French trials, Keggresse used an endless rubber band having a width of 9 $\frac{1}{2}$  in. and a length of 63 in. in contact with the ground. This band is carried on pulleys of 18 in. diameter, the rear pulleys, mounted on the ordinary axle shaft being the drivers, and the forward ones carried in a fork with radius rods for maintaining tension, being the idlers. The belt has a minimum thickness of half an inch, but is fitted with stiffening bands along each edge and with ribs to secure greater adherence, which give an increased maximum thickness.

The method of holding the band on the pulleys, and at the same time of preventing slip without unnecessary tension on the belt, is interesting. Teeth of rubber and canvas, with a certain mixture of cork, are formed on the inner face of the band. The pressed steel pulleys have rounded edges and are in pairs. The face width is 4 $\frac{1}{4}$  in. Two are mounted on the same shaft leaving a space between them of 1 in., and the teeth on the inner face of the endless band run in this space. The inner pulley of each pair is fixed, and the outer one has a tendency to move inward on the shaft as the drive is taken up. The tendency to slip is thus minimized.

Between the driving and the driven pulleys there are

four pairs of rollers of 7 in. diameter and 4 in. face. Practically all the load is carried on these, for the idler pulleys, being mounted in a pivoted fork, are kept on the ground only by their own weight. A couple of broad straps encircling the axle and a cross frame member keep these pulleys in a slightly raised position.

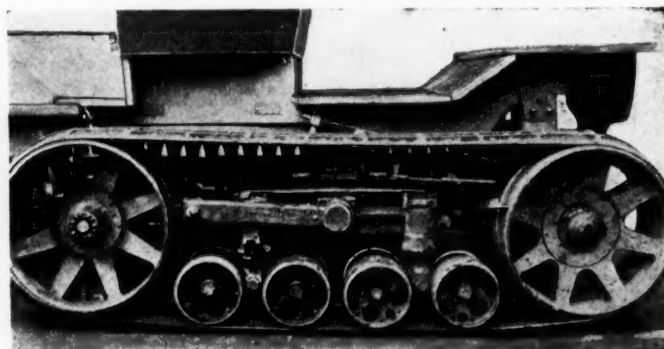
The weight of the machine is such as to give a pressure on the ground of about 1 lb. per sq. in.

The ordinary steering gear is maintained, each front wheel being fitted with a very flexible laminated wood skid with laminated springs, the dimensions being roughly 11 in. in width by 4 ft. in length. Each skid is cut away in the center so as to allow the wheel to pass through to a depth of about 1 $\frac{1}{2}$  in., so that on a hard surface the weight is taken on the pneumatic tires, and the skids only come into play when the tire has bedded in the snow to this extent. The skids are carried in brackets from the steering pivot and are free to swing to a certain extent, so if an obstacle is struck the skid swings up before it, and its flexible construction enables it to absorb the shock. The front springs of the car are maintained.

Two of the Citroens equipped with the Keggresse appliance had the normal gear ratio of 4 $\frac{1}{2}$  to 1. The third machine had an additional reduction gear fitted, giving a total reduction of 9 to 1. All three machines operated over the snow, but the low gear reduction one was more suitable for work on the mountain side. The machines were brought down 63 per cent gradients and climbed 22 per cent gradients.



Keggresse motor sleigh



Detail of the-track-laying mechanism



# Influence of Nickel on Cast Iron

Best results obtained with alloy containing 1 per cent nickel, the increase in compressive and transverse strength amounting to 30 per cent, while tensile strength increases 25 per cent and the hardness 18 per cent. Effect of cobalt reverse of that with nickel, except in respect to hardness.

THE use of alloy steels has assumed great importance during recent years, and their properties have been the subject of numerous researches. The same does not apply to the alloys which may be obtained with cast iron. About all that can be found on this subject in the literature of the industries is a few general studies on the influence of titanium and vanadium on the properties of cast iron. The influence of nickel it appears has never been investigated, notwithstanding the fact that this metal has long been used in the manufacture of steel. Messrs. Buner and Piwowarski have endeavored to supply information on this subject and have reported the results of their experiments in *Stahl und Eisen*.

The metal used in the experiments of the authors was Swedish charcoal iron with a total carbon content of 3.90 per cent, of which 2.80 per cent was graphitic carbon, 0.048 per cent of phosphorus, 0.18 per cent of manganese and 0.69 per cent of silicon.

Fusion tests on masses of 100 grams, to which had been added 1.2 to 3 grams of nickel, showed that this metal readily forms an alloy at a temperature only 50 deg. C. higher than the melting temperature of cast iron. Operations were then continued on larger masses. In a graphite crucible 8 in. high and 4 in. in diameter at the top, 2250 grams of cast iron (about 5 lb.) were molten. The temperature was then raised exactly 100 deg. C. above the melting point, and the nickel then added in small fragments. The bath was agitated with a ring of carbon and the alloy was then poured into molds in such a way as to obtain test pieces of 20 mm. diameter and 650 mm. length.

Several batches were thus made in succession, with increasing proportions of nickel, not exceeding 2 to 3 per cent of nickel, however, as in that case the product becomes too expensive.

The test pieces were subjected to tension tests on a length of 600 mm. until fracture. After the fracture, chips were removed from one of the parts by means of a milling cutter for the chemical analysis, and a piece 15 mm. in length was sawed off for photo-micrographic purposes. From the remainder there were made two test pieces for shock tests and two cubes for compression tests. The shock tests were made with a Charpy 10 kgm. shock test machine and the compression tests with a Martens 50-ton machine. The pieces remaining after the shock tests, which measured 10 x 10 x 15 mm., served to determine the solubility in acids. They were subjected for a period of 24 hours to the action of a 1 per cent sulphuric acid solu-

tion and the loss in weight determined, as noted below.

From the other portion of the original test piece there were made smaller test pieces for flexure tests. After photo-micrographic records had been taken of polished surfaces, hardness tests were made with the Brinell ball hardness testing instrument. The hardness was calculated by the following formula:

$$H \text{ (hardness)} = \frac{P}{\text{surface}} = \frac{2P}{\pi D (D - \sqrt{D^2 - d^2})}$$

in which  $P$  is the pressure exerted (1500 kg.);  $D$ , the diameter of the ball (10 mm.) and  $d$  the diameter of the impression. The results of these experiments are summarized in the accompanying table.

The best results are obtained with an alloy of 1 per cent nickel. The transverse strength is increased 30 per cent; the compressive strength, 30 per cent.; the tensile strength, 25 per cent, while the hardness is increased only 18 per cent. An addition of nickel of 1½ per cent gave no advantage whatever, the influence of the nickel on the separation of graphite more than compensating for the favorable effect on the ferrite.

Metallographic studies showed that the metal presented the aspect of a good gray iron, with needles of graphite regularly distributed in a mass of ferrite and nice laminations of pearlite.

For the manufacture of high tensile cast iron for machine parts, gear blanks, etc., a cast iron containing 1.2 per cent of nickel may be recommended. That the melting point is raised 5 deg. is of no particular consequence in practice.

It was considered interesting to find out whether cobalt, which is used more and more in alloy steels and whose physical and chemical properties are very close to those of nickel, had effects similar to those of nickel when alloyed with cast iron.

The methods followed in the experiments were exactly the same as those in the experiments with nickel. Table I gives the results obtained. They are diametrically opposed to those obtained with nickel. The resistance to bending diminished rapidly, the tensile and compression strengths decreased somewhat, while the hardness is slightly increased. These results are in accordance with those of the chemical analysis. Cobalt retards the separation of the graphite and favors the formation of carbides. Therefore the use of cobalt for improving cast iron is out of the question.

Table I—Results of Tests on Cast Iron with Nickel and Cobalt Additions

No. of Test	Ni., Per Cent	Co., Per Cent	Total Carbon, Per Cent	Ratio to Graphitic to Total Carbon, Per Cent	Graphitic Carbon, Per Cent	Transverse Strength, Lbs. Per Sq. In.	Flexure, In.	Tensile Strength, Lbs. Per Sq. In.	Compression Strength, Lbs. Per Sq. In.	Brinell Hardness	Shock Resistance, Lbs. Per Sq. In.	Solubility in Acids*
1	0	0	3.90	73.4	2.83	34,500	0.27	14,340	81,900	145	6.38	18.3
2	0.87	0	3.89	74.1	2.85	44,450	0.27	17,750	106,000	171	6.10	14.6
3	1.25	0	3.79	77.1	2.91	...	...	19,000	92,500	175	5.67	14.8
4	1.95	0	3.70	84.0	3.12	40,200	0.23	15,750	90,000	149	6.80	15.5
5	0	0.91	3.89	74.4	2.88	34,340	0.24	12,780	73,400	148	6.25	16.0
6	0	1.90	3.85	66.5	2.56	27,400	0.22	13,200	76,000	152	5.80	13.9

\*Percentage loss of a 1 cm. cube in 24 hrs.

# Opinions of British Leaders on the Future of Aircraft

Included in this article are some opinions expressed at the Air Conference which were not reported with full significance in the bulletins issued for the press at that time, but which are valuable to commercial world.

**T**HE Proceedings of the British Air Conference, 1920, have been published as a White Paper. The conference, which was the first of its kind, took place at the Guildhall, London.

The range of subjects was so extensive that the proceedings are valuable both to the student of aeronautics and to the commercial world generally.

The proceedings were largely reported in the press at the time of the conference, but there is much interesting new matter, in the form of replies by the readers of papers to points raised in the course of discussion, which is now published for the first time:

## Sir Frederick Sykes's Views

Major-General Sir Frederick Sykes, Controller-General of Civil Aviation, who read a paper on "Civil Aviation and Air Services" points out, in the course of his reply, that civil and service aviation are closely allied and that the nation which is the strongest in commercial air traffic will be the strongest also in the aerial warfare of the future. He thinks that the war has proved that military power, whether on land, on sea, or in the air, evolving naturally from the exigencies of imperial responsibility and world trade is healthier than a military system artificially imposed upon the State. The extent to which civil air traffic will be carried on in the event of a future war will depend, he believes, on the measure of importance air transport organization has attained. On the other hand, he states that there must always be a division between civil and service aviation and that the more useful aircraft become for commerce, the greater will be the tendency for civil and service types of machines to diverge. "You cannot economically in peace use service machines for air traffic," he says, "any more than you could use a warship as a passenger or freight steamer." For that reason some of the proposals which had been made that the Government should build airplanes capable of being used in war and lend them to companies to operate, and that the Air Ministry should make an allowance toward every machine and the salary of every pilot employed in commercial transport, on the understanding that the whole of the machinery should be taken over by the Government in emergency, are hardly practicable. Such schemes, if carried out, would possess, he believes, the double disadvantage of militating against the development of commercial types and of impeding private enterprise by a system of bureaucratic control.

Gen. Sykes expresses himself as being fully in accord with the proposal that all mails should be "surrendered" to aircraft operating on continental air routes, and while he thinks that this would be a great and essential step forward, he doubts whether the Post Office can organize this support quickly enough and on a sufficient scale to meet the difficulties of the next two or three years.

In the interval he considers it necessary that direct subsidies should be granted, a proposal which has been authorized since the Conference took place.

## Suggestions for Helping British Aviation

The paper on "The Operation of Civil Aircraft in Relation to the Constructor" was by H. White Smith, C.B.E., chairman of the Society of British Aircraft Constructors, who deals with many points raised by subsequent speakers.

He thinks that much has still to be done to improve the present standard of comfort on aeroplanes and he believes that if air services are to become popular the ordinary traveling public has yet to be convinced that the air fare is worth the difference over that charged for rail and steamer journeys.

While development of new types of civil aircraft is proceeding, he does not think that we can claim to have reached yet the point of commercial success and he considers that subsidies are highly necessary in order to carry on until such time as aircraft become developed. He points out further that although the running costs of the latest types of aircraft are most helpful, yet there are so few actually in service that little benefit is derived from improved economies, and that the transport companies will need to spend a large amount of capital in order to purchase latest types and to bring their fleets up to date. He suggests that possibly some help towards the provision of these latest types could be given in order to allow old war types to be scrapped.

## Lines of Technical Development

Air Vice Marshall Sir E. L. Ellington, Director-General of Supply and Research, spoke on "The Present Position of Aircraft Research and Contemplated Development." In his reply he outlines the development which is taking place in the design of suitable aerial cameras, and in other experimental photographic work. Included among these are a shock-absorbing camera mounting, an automobile film camera, embodying all the necessary instruments for survey purposes, instruments for recording angle of tilt at the moment of exposure and the development of night photography.

Although the Air Marshall's advocacy of the possible usefulness of the steam engine for aircraft work was strongly questioned, he now states that "taking it all round I still strongly consider that the steam engine is sufficiently attractive for aircraft to justify some preliminary experiments on the matter."

Capt. F. S. Barnwell, who dealt with the question of "The Technical Aspects of Civil and Service Aviation," urges the continuance of research as to the efficiency of the thick tapered cantilever wing, suggests that all future aeroplanes (at least all civil ones) must be stable and states that there is no serious difficulty in attaining



stability without any appreciable loss of performance. In this connection he mentions that instability is not by any means the greatest source of danger; engine failure he places first with low power and poor range of vision as being nearly as serious in practice.

#### Co-operation With Navy and Army

Air Marshall Sir H. M. Trenchard, Chief of the Air Staff, who spoke on "Aspects of Service Aviation," deals mainly with the question raised regarding the seconding of naval and military officers for service in the air force. He thinks that the views expressed by representatives of the Admiralty and the War Office that "there might be danger of officers seconded to the Air Force losing touch with the parent services and in consequence becoming ultimately less valuable in their capacity as officers of that service," are too narrow.

There is some truth, he believes, in the suggestion that there is a danger of this sort in all specialization, but it is on the whole readily surmountable in practice and he voices the opinion that it is desirable for the two older services to obtain a knowledge of air warfare which can only be obtained by allowing some of their officers to be trained by, and serve for a time in the Royal Air Force. In so doing he is convinced that they will gain themselves and that the Air Force, too, will unquestionably gain seems clear to him that if the national forces are regarded (as they should be) as serving one common national purpose, that purpose must be advanced by maintaining a steady flow of officers of the sea and land forces to and from the air force. The air, which is over the sea and land, presents new problems to the fighters on each which must be studied in conjunction and not in isolation. The air is one, and the Air Force has been created to embrace all who fight in it.

#### Possibilities of Commercial Airships

Sir Trevor Dawson, R.N., who spoke on "The Commercial Airship—Its Operation and Construction."

Sir Trevor considers that one of the largest airship bases of the future will be somewhere in the Iberian Peninsula and will form the terminal station for airship services to North and South America and also to South Africa; the great advantage of a terminal station in Spain being that routes from there across the Atlantic entirely avoid the bad weather frequently prevailing in the higher latitudes. From this terminal station it would be practicable to use, for distributive services in Europe, smaller airships and aeroplanes of much greater speed, which would be little affected by bad weather.

He emphasizes also the need for extensive experiments being carried out in connection with the mooring of airships to mooring towers and also mooring over the water, and he hopes that the Air Ministry will be able to do some practical work in those directions, as well as in investigating the question of using hydrogen fuel, particularly for commercial purposes.

He believes that naval officers are now convinced of the great value of airships for long endurance patrol work over sea and that as the commercial airship will be readily convertible into a naval cruiser with very little alteration indeed, the ships could take up active service within a matter of days after receiving orders for mobilization. The development in design produced by commercial experience will be equally applicable to the design of service airships which, in his opinion, is a strong argument in favor of State assistance being given for the establishment of commercial airship services and for the construction of large types of airships which could be operated on a successful commercial basis.

## Aircraft Cooling System Data

THE branch of the German army administration which, during the war, was entrusted with the procurement of aircraft and accessories was known as the Flugzeugmeisterei. In addition to purchasing this material for the army, it was the duty of the Flugzeugmeisterei to carry on the research work necessary to advance the design of aircraft as rapidly as possible. The result was that in the course of time there were organized departments of a technical character for every branch of aircraft engineering. A valuable working basis was found in the aircraft experimental laboratory at Adlershof, organized two years before the war, which placed all of its equipment and its whole personnel at the service of the aerial arm. Additional research men of established reputation were secured for investigating unsolved problems of design. The results obtained were circulated immediately among interested parties through technical reports, and at the conclusion of the state of war these reports were made available also to the general public.

The problem then arose of making available to aircraft specialists the results which had not been published in the reports up to the fall of 1918 and at the same time to give the greatest possible publicity to the general results of the experimental work of the Flugzeugmeisterei, which constituted a valuable basis for further development in this field. This led to the idea of issuing a large work, somewhat in the nature of a scientific legacy of the Flugzeugmeisterei (which latter was dis-

solved in accordance with the treaty of Versailles) for the promotion of scientific design and as a stimulant to the urgently needed research work in this field. Written in strictly scientific and impartial style, this Handbook of Aircraft Engineering was intended to place at the disposal of designers and testers of planes for the coming commercial aviation in compact form the exceedingly valuable data concerning experiences of the period 1914-1918.

This Handbook of Aircraft Engineering, written in German, is issued in a number of volumes, each dealing with a specific subject. Vol. VI, Part II, entitled Cooling and Coolers for Aircraft Engines, by Dr. Ing Pütz, with a supplement on the Elements of the Cooling Process by Prof. Dr. Trefftz and Dr. Pohlhausen, has been sent us for review, the publishers being Richard Carl Schmidt & Co. of Berlin. This book contains a great deal of experimental data on aircraft radiators, systematically arranged, and is well illustrated. A list of the chapter headings will give an idea of the contents and the manner of treatment. This list is as follows: Absorption of Heat by the Cooling Water; Circulation of the Water in the Cooling Circuit; Dispersal of Heat in the Radiator; Weight of Radiators; Air Resistance of Radiators; Internal Construction of Radiators; Development of Radiator Constructions; The Radiator in the Airplane; Radiator Accessories; The Cooling Medium and Treatment of the Radiator in Winter; Elements of the Cooling Process.

# Malleable Castings Production as Related to the Automotive Industry

The history of an industry has a more definite bearing upon the quality of its product than is generally recognized. This article traces the technical and commercial development of malleable castings production. Similar articles will follow concerning other industries. The facts are worth consideration in analyzing materials for car and truck construction.

THE materials which go into automotive vehicles are being studied with renewed care. The time has passed when manufacturers were tempted to compete for material of doubtful quality at almost any price. Castings are now being more carefully inspected; performance is being more accurately followed and checked, with the realization that keen competition in the selling market is demanding more perfection of detail and more uniform standards of performance.

Among the products which have been extensively utilized in the automotive industry during recent years is the malleable iron casting. The history of the technical and commercial development of the malleable casting, moreover, indicates that comparatively meager information has been widely published concerning the methods by which it is manufactured, the reasons underlying its reputation for lack of uniformity, and the methods by which distinct improvements have been brought about in its qualities during the last seven years.

The special interest in quality and standards of materials which is being taken just at this time by engineers and purchasing agents renders of special interest an examination of the malleable castings industry in its relation to the automotive industry from an engineering and commercial standpoint.

Up until three or four years ago, the malleable iron industry was in a more or less chaotic condition. The process of making malleable iron had been known in a general way, of course, ever since 1722, but the early development of the industry, even in this country, was characterized by rule-of-thumb methods, lack of scientific data, and much secrecy about what scientific facts were known by individual manufacturers.

Among the pioneers of the industry in America, the name of Seth Boyden stands out prominently. Boyden performed his work in Newark, N. J., about 1820-1835. In attempting to duplicate the European practice in making malleable, by chance he hit upon the practical method of the graphitizing anneal. This he accomplished after six years' work trying to duplicate European castings. His discovery marked the beginning of a new process and formed the basis of the present malleable castings industry in the United States.

The early uses of malleable castings were chiefly for agricultural implements. Here malleable castings replaced cast and wrought iron to a large extent. About 1880, malleable castings began to be utilized in railroad car construction. For a considerable period of time the railroads absorbed a large percentage of malleable production.

This demand did not continue, however, and had fallen

off very materially just about the time the automobile industry began to absorb a large number of malleable castings.

The reason for this falling off in railroad demand is worthy of special note, since it bears to a large extent upon more recent developments.

Until seven or eight years ago, the manufacture of malleable castings was supposed to be by means of a secret process. A few large organizations were equipped for research work, but the smaller companies were forced to go along as best they could. H. A. Schwartz, of the National Malleable Castings Co., wrote recently: "During all this time the results of none of these investigations became publicly available and therefore it is difficult to accurately chronicle the scientific development of the art. The organizations collecting scientific and research data did not feel it to be sound business policy to make public disclosures of their work. Regardless of whether or not this policy was fundamentally sound from the manufacturers viewpoint, it certainly proved a handicap to the consumer, who remained in ignorance both of the theoretical principles and practical applications of the manufacture of malleable castings.

"... There still persisted in the engineers handbooks and in the technical press a mass of ill-supported conceptions largely predicated upon a confusion with the white heart process. . . . Since none of those who knew better felt called upon to publicly combat statements of this character, it is not surprising that the engineering public was left in ignorance and hence in distrust of the qualities of the material.

"Moreover, it is not surprising that in the absence of guidance by those better informed, some of the less intelligent and progressive manufacturers did not clearly understand the principles of the process they practiced and therefore produced unsatisfactory castings."

The result of this condition was that so many poor castings were produced by those firms which did not have facilities for scientific research, that even those firms which did produce a more uniform product found themselves unable to market it properly because of the almost universal distrust of the malleable casting in general. As one writer put it, the users seem to blame the failure of a steel casting upon the way it was manufactured, while they blamed the failure of a malleable casting upon the inherent nature of malleable.

These factors are largely responsible for the falling off in the use of malleable in those lines which had formerly utilized it extensively. As engineers know, the chief faults attributed to malleable castings have been:

1. Lack of uniform quality; undependability.



## 2. Lack of ductility.

Facing these facts, together with the necessity for meeting the new problems brought up by the extensive use of malleable castings by the automobile industry, the malleable producers recognized the necessity for a definite effort on their part to restore confidence in their product through eliminating so far as possible the valid objections recorded above.

This was the condition of the industry about 1915 before extensive efforts in scientific research and testing of materials through co-operative action had begun. There were at that time about twenty-five members in the American Malleable Castings Association which had been formed some ten years before. This group of representative manufacturers determined to enlarge their past field of co-operative action and to take certain definite steps in advance. They determined:

1. To go the full road along the lines of metallurgical research, regardless of cost.
2. To make every public statement regarding progress conservative, and accompanied by data which would substantiate in detail every statement made.

The research and testing work was placed in the hands of a consulting engineer, Enrique Touceda, of Albany, N. Y., and extensive work has been carried on along these lines ever since. A careful analysis of the situation indicates that the importance of this work is relatively very great in considering the present status and future possibilities of the malleable casting. For this reason, an account of the general nature of the tests together with the results obtained will be of interest.

"When the research work was started," said Mr. Touceda recently, it was found that by far the majority of the members had no system of testing the quality of their product, aside from the twisting and bending of a casting, in order to ascertain its ductility, or the bending of test lugs attached to the castings. Consequently there was no way in which could be compared the quality of the product of one member with that of another. To be candid, there was available no information of value that could be given to the engineer who might be seeking information of this character."

The first step, then, was to standardize tests so that comparative records could be made and kept. This was accomplished and at the present time tests are made for ductility, tensile strength, and elongation. It is outside the scope of this article to describe in detail the methods by which these tests are made. It is worthy of note, however, that a visitor is welcomed very heartily at the testing laboratories by the consulting engineer and is given every facility for examining the methods and equipment used in making the various tests. A detailed description of the tests may be found in the paper on "Research Work on Malleable Iron," presented by Enrique Touceda before the A. S. M. E. at the Spring Meeting in 1919.

One tensile-test bar and one test wedge from some one heat of each day's run are sent by each member to the consulting engineer. Accurate records of all tests are kept, and by this means the following factors can be determined:

1. The quality of each member's product.
2. The quality of the product of the society as a whole.
3. The comparative progress of the quality in each case.

Each month a report is made of the results of the tests. This report is printed and is distributed in the form of a bulletin. The members are classified into

those who make railway castings and those who do not. To the former is assigned a number and to the latter a letter. Thus each producer can identify his own record, but not that of anyone else. In this way he is able to compare the standard and quality of his own work with that of his competitors.

A certificate is issued to each foundry which for three months has sent daily samples for test, in cases where every one of these samples has met the requirements of the association as to physical qualities. The requirements of the association are identical with the standard specification for malleable castings set up by the American Society for Testing Materials which require a minimum tensile strength of 45,000 pounds per square inch and an elongation of 7.5 per cent in 2 inches.

It is worth analyzing just what this certificate means. In the first place, it obviously means that the holder for the last three months has done consistently high quality work. It is an indication that the vast majority of castings going out from that foundry are of a uniformly high quality.

Certain "loop-holes" appear, however, which must be considered:

1. The test bar sent to the consulting engineer is taken from only one heat of the day. There may be several heats, the test bar having been taken from a selected heat.
2. All bars from the same heat may not be of uniform quality because of defects in the furnace.
3. It might be possible for special bars to be laid aside to be sent for testing purposes.

On the other hand there are certain definite factors which offset these objections to a large extent. The consulting engineer maintains a force of four inspectors who spend their time going about from one to another of the 75 foundries comprised in the association membership. The inspectors mark and place certain bars in various heats and later choose samples from those placed for further inspection.

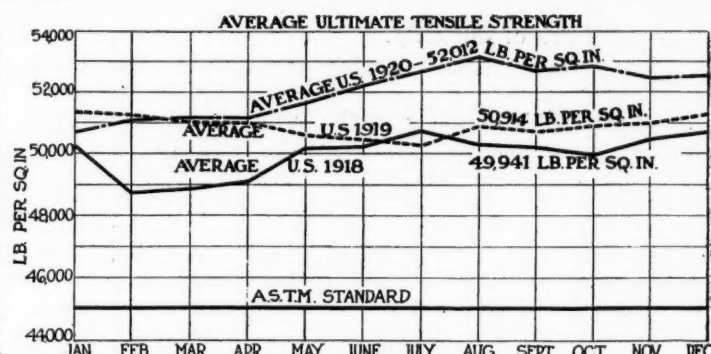
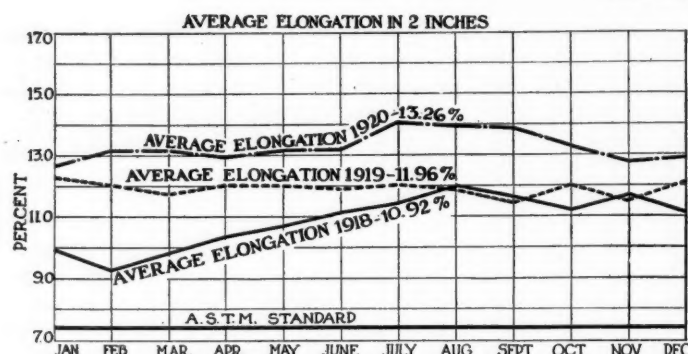
More than this, however, is to be considered the basic principle upon which this testing and research work was founded. It was begun because the producers realized the existence of a lack of confidence in their product. It was decided that the only possible way to rebuild the industry was to restore confidence. And that confidence could be restored in only three ways:

1. By scientific research to determine the way to make uniformly high grade castings.
2. By disseminating that knowledge among all members so that the entire association could make such castings.
3. By treating the engineering public with utter honesty in the publication of results.

In other words, these producers realize that any attempt to "beat the game" would be merely an act of fooling themselves; that it would really be very bad business for them in the long run. It was because they were sold on this idea that they undertook the research and testing work in the beginning.

There is no "hedging" in connection with the granting of a certificate. Some producers often miss by a very small margin, but the certificate is not granted in such cases. Moreover, a certificate granted for one quarter can be retained by the producer only during the next quarter. He must then return it to the consulting engineer. Then he receives a new certificate, if his record warrants it.

When a producer is not coming up to standards, the consulting engineer attempts to help him in every way



Charts showing a comparison between the results obtained by the association as a whole during the period shown above, and the requirements of the A. S. T.M. standard specification for malleable iron castings

possible, that his product may be brought up to the proper quality. Such advisory work is constantly going on.

New furnaces are now being designed in many cases by the consulting engineer in accordance with standards determined after a long period of scientific research.

It is worth special notice, in connection with the granting of this certificate of quality, that there are several firms, members of the association for a number of years, which have never yet obtained this certificate indicative of uniformly high quality for a period of three months. This fact in itself indicates that the certificate is awarded only on the basis of merit and that it may play an important part in the mind of the engineer and purchasing agent when determining the producer with whom to place orders. The certificate may be said in a general way to be a strong indication of the uniformly high quality of the maker's product.

The research work has resulted in the determination of standards for practical use and in the raising of the quality and uniformity of the castings produced.

The accompanying chart, Fig. 1, shows the comparative test records as regards elongation and tensile strength of the castings produced by members of the American Malleable Castings Association since 1918.

The chart shows a very definite rise in the quality of malleable castings since the beginning of the research work. The increased percentage of average elongation is specially to be noted. Before the research was undertaken many firms were producing castings with a very high ultimate strength but with an average elongation of something like  $3\frac{1}{2}$  per cent.

Another factor to be considered in examining this chart is that the membership of the association has been constantly increasing during the period covered. New firms were coming in which had not had the benefit of the results of the research work and which were in nearly every case "weak brothers" for a certain period. This fact tends, of course, to reduce somewhat the average rise in quality.

It will be noted that no very definite increase in tensile strength is apparent in 1919. According to officials of the association this is attributable largely to the fact that the material available for manufacture was so poor as to make it a very difficult task to keep castings even up to the former standard. Some users of the product, on the other hand, lay the blame at the door of lowered standards of manufacture. These users claim that because of excessive bidding for the product on the part of automotive manufacturers, the demand became so much greater than the supply that malleable producers yielded to the temptation to shorten the time of annealing and in other ways speed up production at the expense of quality. The 1920 curves, however, show a marked increase both in tensile strength and elongation.

The automotive industry has undoubtedly played a large part in the recent development of the malleable castings industry. W. G. Kranz told the American Foundrymen's Association several years ago that "It was not until the automobile industry sprang up that the physical properties of malleable iron received very much consideration from the consumer. The automobile engineer appreciated the necessity for a material to withstand shocks and yet be easily machined, and found in malleable castings exactly what he wanted. It is gratifying to note that to-day a very large tonnage is going to that industry."

It is not the purpose of this paper to attempt to discuss the relative efficiency of malleable castings as opposed to other materials for specific automobile parts. It was thought, however, that the extensive work which has been done during recent years by malleable makers in regard to scientific research, standard tests and definitely attempting to maintain and reward uniformity of high quality would be of special interest to automotive engineers and designers just at this time.

The claims of the malleable manufacturers as regards the adaptability of their product in certain cases are well known to engineers. Briefly, the chief properties claimed may be listed as follows:

1. Ability to be poured thin and to be flowed into more intricate designs than steel.
2. Ease of machining.
3. Ductility.
4. Light weight in relation to ultimate strength.
5. Relative cheapness under ordinary market conditions.

The following list of automobile and truck parts to which the malleable manufacturers consider their product adapted is of interest:

Steering wheel spider.	Control rod levers and clevises.
Differential housing.	Wheel hubs.
Transmission housing.	Robe rail fittings.
Rear axle brake housing.	Clutch parts.
Timing gear housing.	Radiator inlet and outlet pipes.
Universal joint bearings.	Hand brake and gear-shift levers.
Tire rack supports.	Pedal pads.
Door hinges.	
Steering post bracket.	
Windshield fittings.	

Concerning the increased use of malleable in the automobile industry, Robert C. Bell, secretary of the American Malleable Castings Association, writes:

"We attempted about two years ago to ascertain the production of malleable castings that were used in the automotive industry, although the questionnaire sent out at that time did not produce satisfactory results for the reason that so many of our members do not differentiate between the production of different classes of cast-



ings. We know, however, that from 1914 to 1919, and the same is true of 1920, that the production of malleables for use in the automotive industry showed a steady increase in tonnage. This statement is borne out by the fact that the foundries which specialize in automotive work have steadily increased their tonnage covering the past five or more years."

The automotive industry started to buy malleable castings at a point when the malleable industry was in a rather critical position. The malleable industry had multiplied its capacity by 5 between 1900 and 1913 and its productive capacity had risen accordingly. With the decrease in railroad and agricultural implement work, the automotive industry played a large part in utilizing the productive capacity that had been built up. And it may be said, that the malleable industry has in return been doing its part by the investment of large sums in research and experimental work to bring its product up to the standards of uniformity and quality necessary to meet the requirements.

Mr. Bell states that "There are no figures available to show the effect on the malleable castings industry by its contact with the automotive industry. We can say this; however, that the development of the automotive industry has been quite beneficial to the malleable castings industry both in volume of business and especially in the desire of the automotive buyer for better grades of malleable and the desire of the principal malleable foundries specializing in automobile work to constantly give the automobile manufacturer a more uniform and more dependable product."

The steel casting and the drop forging are considered to be the chief competitor of the malleable castings, although each product has certain individual properties

which render it superior for specific purposes. In an effort to make the product more popular during recent years, the malleable producers have made a definite effort to bring to the attention of engineers the efforts which are being made to standardize its quality and render it more uniform.

The consulting engineer of the Association has been encouraged to explain the research and testing work before various engineering bodies and considerable literature has been built up in various trade papers by different members of the industry. In certain instances papers read before the American Foundrymen's Association concerning malleable have been reprinted and distributed to purchasing agents and engineers who might be interested. In brief, it may be said that during the last seven years the veil of secrecy has been lifted to a large extent from the malleable process and industry and considerable data are available concerning both the technical and commercial development of the industry for those interested to investigate the subject in more detail.

This work of the Association, together with the development of the malleable industry, has been discussed here because the automotive industry has played such an important, though an indirect, part in it, and because the factors behind the development of the industries contributing to the automotive industry may form a very valuable background for production and engineering men when discussing the relative merits and possibilities of the different materials which are to be utilized. The history and line of development followed by an industry is likely to have a more direct bearing upon the quality and properties of its product than is generally recognized.

## Properties of Ordinary Wood Compared with Plywood

WOOD, as is well known, is a non-homogeneous material, with widely different properties in the various directions relative to the grain. This difference must be recognized in all wood construction, and the size and form of parts and placement of wood should be such as to utilize to the best advantage the difference in properties along and across the grain. Were wood a homogeneous material such as cast iron, having the same strength properties in all directions that it has parallel to the grain, it would be unexcelled for all structural parts where strength with small weight is desired.

The Forest Products Laboratory has found that the tensile strength of wood may be twenty times as high parallel to the grain as perpendicular to the grain, and its modulus of elasticity from fifteen to twenty times as high. In the case of shear the strength is reversed, the shearing strength perpendicular to the grain being much greater than parallel to the grain. The low parallel-to-the-grain shearing strength makes the utilization of the tensile strength of wood along the grain difficult, since failure will usually occur through shear at the fastening before the maximum tensile strength of the member is reached.

The large shrinkage of wood across the grain with changing moisture content may introduce distortions in a board that decrease its uses where a broad, flat surface is desired. The shrinkage from the green to the oven-dry condition across the grain for a flat-sawed board is about 8 per cent and for quarter-sawed board about  $4\frac{1}{2}$  per cent., while the shrinkage parallel to the grain is practically negligible for most species.

It is not always possible to proportion a solid plank so as to develop the necessary strength in every direction and at the same time utilize the full strength of the wood in all

directions of the grain. In such cases it is the purpose of plywood to meet this deficiency by cross banding, which results in a redistribution of the material.

In building up plywood a step is made in obtaining equality of properties in two directions, parallel and perpendicular to the edge of a board. The greater the number of plies used for a given panel thickness, the more homogeneous in properties is the finished panel. Broadly speaking, what is gained in one direction is lost in the other. For a very large number of plies it may be assumed that the tensile strength in two directions is the same and that it is equal to the average of the parallel-to-the-grain and perpendicular-to-the-grain values of an ordinary board.

## An Electric Truck for Industrial and Street Use

(Continued from page 693)

all electrical mechanism without the use of a key. It is noteworthy that anti-friction bearings are used throughout the truck, the armature shaft bearings being of the ball type, and the bearings on the intermediate dash and the axles, roller bearings.

Regular practice is to provide wheels on the legs on one end of the platforms, the other pair of legs being left plain. This has been found convenient should it be desired to move the platforms while the truck is busy elsewhere, since one end can readily be raised and the platform handled like a two-wheel wheelbarrow. The plain legs make an effective brake so that the loaded platform can be safely left on any grade. For special purposes wheels can be provided on all four legs, but this is not ordinarily done because of danger of rolling away unless left on a level surface.

# Incentives to Better Workmanship Appeal to a Variety of Instincts

When the management is interested in the individual worker only to the extent of his immediate quantity of production, the workman probably will be interested in the company to the same limited extent. The incentive plan described here gives the worker numerous motives to strive for greater personal development, increasing his ultimate value.

By Norman G. Shidle

**T**HE special production value of a willing and enthusiastic worker is pretty well recognized by industrial managers. Likewise the impossibility of producing such workers under conditions of continuous monotony work and without the use of incentives other than wage payments is becoming increasingly evident. Despite the realization of these facts, methods of effecting remedies for present difficulties have not yet been worked out except to a very limited degree.

Experiments of one kind and another have been tried in various plants, some with good results, others less successfully. Yet it is only through making such experiments and analyzing the results that standards for future procedure can be established. For that reason an examination of the methods utilized by certain firms which have based their action upon a carefully planned, intelligent basis is of special value.

Too many so-called incentive plans have revolved about the appeal to the single instinct of desire for monetary gain. This appeal is undoubtedly a very strong one, and works to a decided advantage in every case, but where it is the only appeal, there are very likely to arise storms which it cannot successfully weather. This fact must be recognized even though it is fundamental that satisfactory wages are a prerequisite to gaining the active co-operation of a worker.

## A Varied Appeal

To successfully analyze the other instincts to which an appeal may be made, however, and to determine methods by which such an appeal can be made is not an easy matter. This is one of the important tasks which confronts the industrial manager in his study of the human element in industry.

A plan by which individual abilities can be rated in a general way and rewarded according to merit has been worked out at the Sperry Gyroscope Company. It involves a number of those factors just discussed and indicates certain practical methods of enlisting more active co-operation from the workman through an appeal to other instincts in addition to that for money.

Each employee is rated as regards four characteristics, each of which bears a definite relation to his job and on the basis of this rating his rate of pay, opportunity for advancement and several other factors are determined.

Before it is possible to rate a man as to his ability on a job, it is necessary, of course, to determine the requirements of the job itself; to outline the qualifications necessary in a man, if he is to fill that job in a first-class

manner. In other words, an accurate job analysis is necessary upon which to base any estimate of the man's proficiency and possibilities.

Such an analysis can take any of the common forms; many firms already have on file job analyses for a majority of the jobs in their shop. The particular type used at the Sperry company is detailed in analysis, but brief in summary. The summary serves as a basis for the rating. Following is a sample which shows the job analysis summary used for all-round machinists:

### Duties

Perform operations in the manufacture, assembling, erection and repair of various kinds of machinery and direct the work of helpers in this connection.

### Qualifications

Machinists in this class must be thoroughly dependable, able to work rapidly with commercial accuracy from blue prints and sketches as well as to lay out the work, carrying it to completion on bench or machine. Must be able to operate as an expert all of the usual machine shop tools and be competent to do the work without the use of jigs or fixtures, checking dimensions with the proper measuring tools. Must have a thorough knowledge of various tools, speeds, feeds for different materials. Worker should possess a knowledge of the use of lubricating, cutting and polishing compounds. Must have a knowledge of such shop arithmetic as common fractions, decimals, simple algebra and trigonometry or be able to use hand books intelligently for the solution of problems in connection with his work.

On machine repair, erection and assembling work, worker must in addition to the above be competent to do the necessary filing, scrapping, fitting and assembling of machined parts making the necessary mechanical adjustments to secure the proper functioning of the apparatus. Must know how to babbitt and condition bearings and be able to do the necessary rigging work.

The requirements of the job having been accurately determined, the workman is rated on the basis of four characteristics:

1. Experience and Education
2. Knowledge of Work
3. General Value to Company
4. Physical Qualifications

Each of these four characteristics are understood to include certain definite factors, while each of them has been included after careful analysis for a specific reason.

"Experience and Education" is understood to apply only to his education as applied to that work which he will be called upon to do. A toolmaker, for instance, would require a knowledge of common arithmetic to



qualify for a high rating, but his knowledge of Latin would have no bearing upon his rating.

Under this head, too, is considered the length of time a man has served in a given trade. This counts for something, since a long experience gives a certain background and breadth of knowledge that is certain to be of value. In this connection, also, are considered the companies with whom he has been associated and the length of service with each. It is believed that a worker's connection with a concern known for a high standard of product and efficient production furnishes an important indication of his ability.

"Knowledge of the Work" comprises somewhat different factors. Although a person acquires knowledge of his work through experience and education, some persons acquire it much more rapidly than others. Under this head are considered familiarity with hand tools, measuring devices, machine tools and materials common to the trade. The worker's ability to plan and execute his work from given instructions, whether oral, written or in blue-print form, is also judged.

"General Value to the Company" is an important consideration. A man with excellent ability and qualifications may be of little value to the company unless he applies that knowledge in an effective manner. A man of less ability may surpass a better equipped man in value to the company simply through the energy and effort with which he goes at his work. Under this head quality and quantity production are taken into account; the ability of a man to maintain a high point of accuracy and skill, combined with speed, is important in determining his ultimate value to the concern.

Dependability and general attitude toward the work are considered under this head and go toward determining the final rating. It is recognized that a worker's disposition, habits and general attitude toward conditions have an influence upon his associates and also reflect directly in his work.

"Physical Ability" is often a vital factor in the effectiveness of a manual worker. His physical qualifications, as to general health, age, etc., are given due consideration.

The four factors are not considered as being equally important; in making up the final rating for the man, a weighted average is used, as follows:

Education and Experience	15%	Value to Company	25%
Knowledge of Work	50%	Physical Ability	10%

The values of the various factors were determined by the personnel manager after conference with the various executives and department heads of the concern, so that they represent the composite view of a number of men, each in a position to judge competently.

Upon the basis of the job analysis and these four factors just described the workman is rated by his foreman and division superintendent. The rating is made on an A, B, C, D basis and appears on a chart as follows:

CLASSIFICATION OF EMPLOYEES

Submitted by \_\_\_\_\_ Date \_\_\_\_\_

Under Rating - Mark A, B, C, or D. Give A to the best qualified employee and D to the employee having the poorest qualifications of any that you know in a given occupation. Mark others according to their standing with regard to these two.

Name	No.	Occupation	Rating				
			Experience	Knowledge of Work	General Ability	Physical Quals.	
Henry Johnson	1248	Machinist	A	A	B	A	95.8
Ralph Hartung	862	Tool Maker	B	A	A	B	95.8
Lucien Arthur	381	Assembler	B	C	C	A	72.4
Robert Kennedy	468	Machine Operator	A	B	A	C	91.6

The percentage value of each worker is determined, to quote from a recent article by M. R. Lott, Superintendent of the Personnel Department, in this way.

"It is assumed that in order that a man should be considered as belonging in a trade, he must possess at least 50 per cent of the qualifications of the ideal man for each general consideration in that trade. In order that the results may be unbiased, the foreman consults with the supervisor and the results are reviewed by a third person. . . .

"The A man would receive the full value for each of the qualifications according to the weighted average noted previously, while the D man would be given half the values of the A, and B and C would be rated in proportion. A score, then, is available for each worker and his rate of pay may be gaged accordingly. The actual values assigned to the groups really have no significance other than providing the same standard of comparison for all. They would be:

- A worker scoring between 95 and 100 would receive the maximum rate
- A worker scoring between 85 and 95 might receive the next lower rate
- A worker scoring between 75 and 85 might receive the next lower rate
- A worker scoring between 65 and 75 might receive the next lower rate
- A worker scoring between 50 and 65 might receive the lowest rate

"While the plan is not perfect, it has assisted in arriving at a more consistent consideration of the merits of an individual and has been the means of correcting, in a manner very advantageous to the worker, discrepancies that existed when there was no standard for analysis and comparison."

This completes the plan insofar as the methods of rating the men is concerned. The man is given a temporary rating when he is employed with the company. This initial rating is made by the employment manager on the basis of the man's past record and the general impression which he makes.

All ratings are checked over, however, on an average of once every three months, so that a man has an opportunity to better his position within a comparatively short period of time.

But of what use is this rating plan? If operated simply to provide an interesting course in mental gymnastics for the personnel manager, it is obviously a waste of time and money. The chief value of any such plan lies in the effectiveness with which it is used. An analysis of the use in the Sperry plant indicates the possible value.

In the first place it is used in connection with wage rates to furnish an incentive for increased pay. All the men at this plant work on day rates, and the wages for each trade are graded from a given base in accordance with this rating plan.

The wage scales are laid out on a form similar to the one given here to illustrate more clearly just how the system is worked out.

#### Rate Schedule

Occupation	Rate per Hour as per Score					
	95-100	90-95	85-90	75-85	65-75	50-65
Trade No. 1	\$0.80	\$0.77	\$0.73	\$0.70	\$0.67	\$0.63
Trade No. 2	.73	.70	.67	.63	.60	.57
Trade No. 3	.80	.77	.73	.70	.67	.63
Trade No. 4	.73	.70	.67	.63	.60	.57
Trade No. 5	.53	.50	.46	.43	.40	.36
Trade No. 6	.73	.70	.67	.63	.60	.57

The plan, then, is useful in grading rates of pay in accordance with all those factors which go toward making

the workman of real permanent value to the company. When wages are dependent entirely upon quantity of production the management may be said to be emphasizing to the worker that this is about the only factor regarding his performance with which it is concerned. In such case, the worker is very likely to have his attention centered almost entirely on this single point and to disregard very largely those other factors which undoubtedly enter in to his ultimate value to the management.

In other words, this system of rating tells the worker, in effect, several things that tend to make him feel like actively supporting his company. Among these are:

1. That the management is interested in him as an individual; that his work is really being watched, and that when he does good work it is immediately recognized. He knows that he is being regarded as an individual personality and that he is not looked upon as merely one cog in the machine.
2. That the management appreciates the development in him of certain qualities which go toward making him a bigger, broader man. The mere fact, for instance, that he takes up some outside course to help him with his work is likely to raise his score, since it indicates a real interest in his task.
3. He knows that the management is interested in his personal development and that in a very practical, immediate and concrete way he can benefit by attempting to develop himself along a number of lines. He is encouraged to grow larger by this consideration which the management takes of a number of factors in adjusting his wage. Where there is but one consideration—quantity production on a single machine, for instance—he is encouraged to grow smaller so far as personality and mental development are concerned.

Every workman knows what his rating is. After it has been made up his foreman notifies him of it. And in this way another benefit of the system is brought out. Every man is not satisfied with the rating that is given him. In such cases he is privileged to go personally to the foreman and then to the personnel manager if he is still unsatisfied. The various factors considered are then discussed with him, his weak points are pointed out and he is encouraged to overcome them that his score may be raised.

Since the whole matter is on a frank and open basis with the workmen, the management is able to talk over strong and weak points with them. In this way the individual worker has been able to understand his own deficiencies and to correct them through personal effort. This is not merely a theory, but a statement of fact made on the basis of numerous cases recorded in Lott's office.

Another advantage of the plan has been to interest the foremen in the human elements of their supervising task. While there was some difficulty at first in convincing them of the practicability of the idea, the results achieved within a short time aided materially in this task. Moreover, the matter of rating men under supervision carries with it some very interesting features which appealed to the foremen and superintendents once they caught the idea.

With this increasing interest of the foremen has come, necessarily, an increased study of men and the human factors as related to production. This in itself is a notable achievement and ultimately will be worth many times the trouble and expense of the rating system.

Other uses are also made of the rating scale. Promotions are made from within the shop whenever possible, and the rating scale is used as a basis for making such advancements. When business depression necessitates laying off men, the rating scale is used again. The score of each man has been used recently as the prime con-

sideration in keeping him or letting him go. The factors regarded in the order of their consideration have been:

1. Rating
2. Home responsibilities, family, etc.
3. Length of service.

Thus a high rating gives a man the best possible insurance against unemployment. It practically insures him permanent work, even in bad times, and thus adds another incentive to make him strive for a good score.

The broad scope and vision of the factors considered in making up the score must constantly be borne in mind when discussing the incentives given the men to attain a high score. In other words, the achievement of a high score by the employee means real personal development, both mentally and spiritually for himself, as well as increased value for the company. It is for that reason the high score is worth striving for; and some might say, for that reason alone.

To sum up, the following advantages may be listed as accruing from this rating plan and its intelligent utilization:

1. To the management:
  - a. Good will and co-operation from the workmen, because of the practical demonstration of its interest in his personal all-round development and growth
  - b. Better quality and quantity production
  - c. Decreased labor turnover
  - d. Increased study and knowledge of the human element on the part of foremen
  - e. Gradual raising of level of ability of workers through understanding and remedy of personal defects
  - f. Better and more pleasant "atmosphere" about the plant because of closer personal contact between management, foremen and workmen.
2. To the workmen:
  - a. Increased wages through personal development
  - b. Unemployment insurance through same means
  - c. Opportunity to see his weak points clearly, to have them discussed sympathetically and to better himself through remedying them.
  - e. An opportunity to have merit rewarded; the danger of being buried in the mass is eliminated.

There are other good features in the plan, some of which go far deeper into the fundamental factors of human relationships in industry than a superficial survey of the rating plan itself would indicate. The plan, though dealing with only a minor part of the industrial relations problem, furnishes an excellent means of meeting one of the questions which arises. Its practicality is attested not only by its success and continued use at the Sperry Gyroscope Company, but also by the fact that the Standard Oil Company of New Jersey is about to put into operation a plan moulded along somewhat the same lines. Since the latter company is instituting the plan at this time of business depression, there is a strong indication that it is regarded as a definite production and financial asset to the management.

A COMBINATION of several manufacturing concerns for the purpose of manufacturing automobiles and trucks has been effected in Poland, and the new concern will be financed by a number of leading Polish banks. Work will begin the coming spring, and it is planned to turn out 1000 complete trucks the first year, about one-half of which will be taken over by the Polish army. Assembly work will be carried on at the factory of Borman & Szwede, Warsaw, while the other factories in the combine will manufacture the parts. For the first year, however, probably 75 per cent of the parts will have to be imported from the United States.



# Is the Dealer an Important Cog in the Wheel?

Dealers often express the doubt as to whether they are appreciated by the heads of the organizations of which they are a part. They quote many instances to support this doubt. Here is some evidence as to their standing as business men and of the amount of business they should do.

By Clyde Jennings

**A** CAR manufacturer's organization can be no stronger than its dealer organization will let it be. The dealer organization cannot develop beyond the limitations set by the manufacturer. Development must be mutual. All concerned will admit this. Neither organization can be paramount, although many situations will arise where the burden, for the time being, will fall most heavily upon one of these two organizations.

With this rather positive basis it is interesting to note the attitude taken by some manufacturing organizations. Recently the man responsible for the functioning of a rather large dealer organization said:

**"We conduct our dealer operations on the Statler Hotel principle, that the dealer is always right. Sometimes the burden of the proof shows that the dealer is not right, and then we handle the situation as an individual case. It is the exception, not the rule, and it is not allowed to sway our policy or operation."**

Only a few months ago a man who has a considerable voice in the operation of a dealer organization talked at considerable length on his problems. All through the conversation he spoke of the dealers as "poor boobs," and always referred to their inability to select the proper papers for advertising, and an inability generally to handle the affairs connected with the selling of cars.

As a bit of pertinent comment on these contrasting attitudes, it can be remarked that the factory represented by the former speaker is now running on a very high percentage of the 1920 production, while the other factory was recently reported to be flat, and it has had some financial tribulations. **The present prosperity of these factories may, or may not, be in any measure due to the sales attitude. You can draw your own conclusion.**

## Rushing Into Business

**H**ERE is an incident worth considering: A short time ago a man in a western city had something like \$150,000 surplus in his selling business, let us say it was lumber. For reasons perfectly satisfactory to himself he did not want to put the surplus back into that business, but wanted to find another merchandising proposition. He investigated many lines and decided upon automobiles. He then studied the list of cars, eliminated those he knew to be well represented, and, after consultations with several persons, selected five makes, with a view of getting the local representation of one of the lines.

He sent out his letters, and waited. Within a week he

had definitely turned down three of the factories to which he wrote. This is how he tells of his experience:

"The first man to see me in response to my letters came to my office at 9:30 a. m. I learned later that he had arrived in town at 8 a. m. First he told me how much money the company thought would be required to swing the deal. I agreed. He asked me if I had the money. I put my documents on the table and right away he accepted me as the future dealer.

"Then it became my turn. I wanted to know something about his company but he did not appear to know much. I asked him what investigation he had made concerning me. He said my letter was sufficiently convincing to his company.

"Long before noon I had turned down his proposition. I could not see that I cared to do business with a company that was so willing to accept a dealer merely on the looks of his bank account.

"Two other companies went the same way. The fourth, after a long period of correspondence and inquiry, offered me the dealership on conditions that I could not then meet. I am now looking for the man to get to join me in this dealer proposition who knows enough about cars to meet the requirements. I think the proposal is a fine one.

"The fifth company eliminated itself, as they did not have production to go into the territory I had asked for."

The net result of this effort to enter the dealer field was three companies out of the five did not make sufficient inquiry concerning the future dealer as to command his respect; a fourth made strong exactions and commanded the entire respect; a fifth showed a very sensible determination not to spread its distribution too thinly.

The question is:

**How nearly does this incident show the trend on motor dealer selection?**

## Size of Establishments

**N**OW as to the dealer.

Recently a number of distributors were asked to estimate the average number of persons employed by the dealers in their territory. The estimates are so close as to supply a very definite idea. The lowest number is 6 to each dealer and the highest is 12. A majority of the answers say 7. So let it be agreed that the average number of employees is something above seven.

One of these answers reads:

"The general average of employees in a town of 5000, handling about 100 low-priced cars annually, would be

seven. In a town of 25,000 handling 500 cars, 25 to 30; 100,000, handling 750 to 800 cars would be 40 to 50."

The point here is that a business establishment that employs an average of more than 7 persons is of a considerably higher rating than the average of mercantile establishments. The man in charge must be a man of some business ability and of some financial standing in his community.

#### How Many Cars?

THE question as to how many cars a dealer in a certain sized city should sell is a moot one. From the opinions heard here and there it is to be feared that some manufacturers, at least, have not given much thought as to whether their dealers were assuming a sufficient sales load to enable them to maintain an establishment in keeping with the merchandise they represented. Following are a number of opinions of distributors who have had a long experience in automobile wholesaling as to the number of cars necessary to maintain an adequate establishment in cities of certain size.

1—In towns of 5000 persons, the number of cars would depend largely upon the price of the car. Taking them at the average of \$1,000 he must sell at least 25 cars to make any money. In towns of 25,000 persons this number should be doubled. In towns of 100,000 persons he should sell a minimum of 126 cars. He must do this in order to conduct a satisfactory business. Assuming, of course, there will be small towns to bring up the population to greater than this in centers of this kind.

2—It is difficult to estimate the number of car sales required to support a dealer in towns of 5000, 25,000 and 100,000. This all depends on the methods of doing business, whether they conduct a garage in connection and whether they conduct a repair department, accessory department, and so forth. I believe it is possible in any of the towns mentioned for a dealer to go into business and, providing his business is properly conducted, make a profit without selling a single automobile; therefore, his car sales should be his real profit. At present the average car dealer hardly takes time to wait on a customer who wants a tire or anything else at a small sum. We dealers have allowed ourselves to think in too large sums, that is, from a volume standpoint and have been negligent toward the small items which really constitute a profit in this business.

3—It depends altogether on the car handled. In the South the medium-priced car always will be the biggest seller. A dealer in the town of 5000 should sell 25 cars to make it profitable, if he looks after his customers and renders any service.

4—A dealer in a town of 5000 should retail no less than 25 cars. A town of 25,000 not less than 50 cars. A town of 100,000 from 150 to 200 cars.

#### A Low Estimate

5—In a town of 5000, a dealer can probably get along with selling 12 or 15 cars because his rent and overhead are very low. He will be his own salesman, and his expenses will be divided between the repair shop, sundry sales, as well as selling cars. In a town of 25,000, if he is an up-to-date dealer, has a good service department and devotes his exclusive time and ability to pushing his car, and it is a good make, carrying not more than two makes of cars and one light truck and his reputation is estab-

lished, he should sell 60 cars and trucks, providing the territory immediately adjoining his town can absorb some of his production.

6—In a town of 5000 population the dealer would have to sell 50 cars or more. In 25,000, 150 or more, and 100,000, 300 or over. This applies, of course, to standard lines that are selling at a good price retail and with a reasonable profit.

7—Using a popular low-priced car as a basis, a dealer should handle 100 cars in a town of 5000, 500 cars in a town of 25,000 and 750 to 900 cars in a town of 100,000.

8—It would be my guess that a dealer in a town of 5000 could sell from 60 to 100 cars and make money constituting about three lines ranging in price from \$1,000 to \$3,000. A town of 25,000 population—80 to 200 cars; 100,000 population, 150 to 300 cars.

9—The dealers in the 5000 town should sell at least 40 to 50 average-priced cars. In towns of 25,000 the market should be proportionate, and in cities of 100,000, if he cannot sell \$400,000 in the year he will waste his time.

There are two sides to this question, just the same as to most questions. It certainly is a problem as to whether the small city dealer is doing as much business as he should, and could do if he put forth the proper effort. The other side is as to whether the manufacturer is supplying him with as many cars as the dealer is entitled to if he maintains a proper establishment. There are obligations on both sides.

This article, except as to the average number of employees, does not consider the dealer in the town smaller than 5000 inhabitants. There are points about the small-town dealer that deserve separate consideration, which will be given in due time.

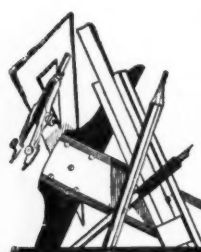
## Denaturants for Industrial Alcohol

A SUB-COMMITTEE of the (British) Empire Motor Fuels Committee has been studying the problem of the most suitable denaturants for power alcohol. In a memorandum drawn up at a conference of the sub-committee with the Board of Customs and Excise it is stated that the denaturant should be soluble in alcohol, benzole and gasoline and in certain mixtures of these; it should not readily be separable from the solutions, but be stable, cheap, plentiful, of nauseous taste and, if possible smell, but not poisonous, readily detectable in traces, and unaffected by metals which its combustion products should, of course, not corrode. J. Stanley has experimented at the Imperial College of Science, and has found that redistilled bone-oil, light caoutchoucine and certain shale-oil products appear best to comply with the desiderata. Bone-oil can be detected in traces of 0.001 per cent, and is less likely accidentally to occur in potable alcohol than some of the other denaturants, pyridine, etc. Bone-oil is a by-product of the animal charcoal manufacture; it contains pyridine (a coal by-product) which is found in some crude spirits. Experiments are also being made on the cracking of petroleum for the production of a denaturant; castor oil yields such a body, but it would be too expensive. It is further mentioned that a substance, capable of imparting to water certain characteristics at a dilution of one part in a million occurs "in certain roots growing in localities where alcohol may eventually be produced."



### Exports of Automobiles and Tires for January, 1921

COUNTRIES	COMMERCIAL			PASSENGER			Parts	TIRES			All Other Tires
	Complete Cars	Chassis		Complete Cars	Chassis			Casings	Inner	Solid	
Europe											
Austria.....											
Azores, etc., Is.....				1	\$1,285						
Belgium.....	2	\$1,700		11	21,295		49,303	8,734	662		
Bulgaria.....							135				
Czechoslovakia.....								320	74		
Denmark.....	2	2,850		9	15,508		844,353	21,146	650	\$1,353	\$150
Finland.....				17	21,200		6,992	881			350
France.....	1	2,460		18	46,473	2	\$2,450	79,117	106		28
Germany.....				1	3,000			9,129	1,221		
Gibraltar.....				3	4,140			389	195		
Greece.....	3	10,140		19	51,987	2	2,000	14,653	3,427	249	
Hungary.....											
Iceland, Faroe Is.....								9,916			
Italy.....				3	2,950			8,841	249	21	
Malta, etc., Is.....	4	1,666		8	14,622			3,835	750		
Netherlands.....	42	29,298		51	98,608			42,587	9,693	944	
Norway.....	1	3,103		5	5,576			70,884	26,321	664	5,806
Poland and Danzig.....			12	37,314	9	14,031		10,463	540	60	
Portugal.....				2	1,980			5,448			
Roumania.....	7	6,147		54	32,956			11,008	6,761	1,929	
Russia in Europe.....	20	10,400						2,332			
Spain.....	12	23,879	9	14,573	162	283,878	1	2,542	370,393	79,410	4,383
Sweden.....	6	31,006	5	5,942	362	414,923		48,751	74,859	6,650	17,000
Switzerland.....	7	14,677	2	252	46	76,455		9,958	6,635	89	
Turkey in Europe.....				10	20,195			11,272	25,037	2,370	1,264
England.....	22	43,406	15	12,433	15	31,973	6	13,209	2,617,307	288,497	3,394
Scotland.....	5	7,290					1	805	2,958	2,301	13
Ireland.....				17	16,385			2,233	53	8	
Yugoslavia, etc.....				2	2,000						
North and South America											
Bermuda.....				3	1,158	1	354	114	128		
British Honduras.....				8	185,595	2	3,285	729,706	62,245	7,393	4,680
Canada.....	67	129,812	11	12,405	38	3,738		1,128	171	300	2,575
Costa Rica.....	6	11,500			19	28,589	1	1,000	7,564	7,533	400
Guatemala.....				6	10,500			4,630	1,365	83	
Honduras.....			5	14,200	5	6,544		4,034	3,448	150	
Nicaragua.....	3	3,403		53	66,670			42,777	17,899	8,544	1,566
Panama.....				5	18,600			2,223	13,376	2,612	402
Salvador.....											
Greenland.....											
Mexico.....	100	158,830	33	111,872	663	600,094		243,597	116,163	17,350	4,692
Miquelon, Langley, etc.....				2	4,800			1,297			
Newfoundland and Labrador.....	3	6,275		15	13,003			6,172	3,769	122	250
Barbados.....				52	46,776			47,334	18,297	1,291	2,040
Jamaica.....	3	11,500		37	34,748			34,401	12,787	749	2,430
Trinidad and Tobago.....			9	20,773	12	12,475		5,158	2,506	176	414
Other British West Indies.....	8	7,362		549	437,259	3	4,006	222,546	226,717	13,089	35,500
Cuba.....	72	89,551	14	37,730	12	11,991	2	594	3,429	1,622	143
Virgin Islands.....	1	495		18	7,905			1,688	1,930	149	
Dutch West Indies.....			12		18,550			13,154	2,897	333	907
French West Indies.....	1	2,180	12	5,760	5	2,100	1	9,962	6,636	1,205	1,041
Haiti.....	11	4,945		30	19,678			47,289	23,060	2,010	2,344
Dominican Republic.....	7	20,257	2	10,350	304	419,540		1,610,061	118,500	11,944	7,365
Argentina.....	3	7,855	3	8,570	2	10,500		2,200	3,929	192	405
Bolivia.....			8	38,202	122	165,059	3	8,400	170,069	113,412	4,727
Brazil.....	13	6,506	10	28,038	48	66,987	5	6,820	62,677	17,018	1,707
Chile.....	13	12,067	3	7,650	31	55,628	1	4,900	20,913	6,994	921
Colombia.....	3	13,605		8	13,358	1	3,300	20,333	2,378	401	
Ecuador.....	3	1,557									
Falkland Is.....	1	545									
British Guiana.....				4	3,650			9,390	2,924	1,624	
Dutch Guiana.....				4	4,195			3,372	2,038	198	
French Guiana.....				1	1,000			1,238	100	76	
Paraguay.....				1	1,200			2,919	280	124	
Peru.....	25	50,524	4	13,387	29	66,207		53,751	39,888	6,603	4,020
Uruguay.....	51	24,081		132	234,808			61,396	32,104	1,050	
Venezuela.....	5	2,248		65	63,944			27,035	26,420	1,558	743
Asia and Far East											
Aden.....				2	3,308			3,471	3,217		
China.....	7	18,058	15	19,888	183	164,245	12	6,816	42,546	25,864	991
Kwantung, leased territory.....				1	6,500			90			150
Chosen.....				1	571			1,097	199		
British India.....	56	114,141	16	31,196	280	306,822	4	7,860	152,074	54,897	4,245
Straits Settlements.....	3	5,529	10	22,704	22	30,200		59,101	4,667	4,667	1,412
Other British East Indies.....	2	3,262		11	16,087			3,601	788	1,267	1,000
Dutch East Indies.....	138	324,324	41	97,917	192	334,685	3	3,870	239,372	23,206	3,787
French Indo China.....			6	4,476	17	24,190	3	4,668	9,807		10,973
Portuguese East Indies.....											1,612
Hongkong.....	5	19,749		14	20,281			2,416	6,283	556	1,713
Japan.....	89	90,321	11	32,730	60	103,770	10	13,400	119,227	13,165	696
Persia.....				36	17,023			4,650			6,387
Russia in Asia.....								1,429			
Siam.....				19	23,929			8,350	6,850	100	
Turkey in Asia.....	7	5,102		129	111,674	13	6,180	19,118	8,519	2,018	
Other Asia.....											
Australia.....	83	125,919	116	177,450	165	193,026	430	495,767	194,819	77,509	5,452
New Zealand.....	34	61,410	15	27,422	259	358,586	5	8,647	130,031	128,696	1,843
Other British Oceania.....								1,137	4,632	1,097	148
French Oceania.....								762	1,161	75	
Other Oceania.....								1,539	34		213
Philippine Islands.....	116	63,466	44	56,683	334	258,814	29	64,620	109,550	90,609	17,513
Africa											
Abyssinia.....											
Belgian Congo.....	10	9,095		10	7,033			2,930			
British South Africa.....	3	5,355	3	4,840	23	24,495	14	14,680	27,689	8,698	1,096
British West Africa.....	13	26,668	3	3,644	164	187,693	11	23,613	87,588	30,206	2,526
British East Africa.....				20	29,173	2	1,699	8,095	9,249		
Canary Islands.....				5	7,455			2,507	2,105		
French Africa.....	4	2,078		60	50,868	1	1,140	11,920	1,753	390	1,010
Kamerun, etc.....	1	440		2	1,695			2,193	825	94	
Italian Africa.....								422			
Liberia.....											
Madagascar.....											
Morocco.....				15	27,647			28,575	940	156	
Portuguese Africa.....	4	2,078	1	3,000	9	8,086		4,102			1,066
Spanish Africa.....											
Egypt.....	6	2,970	8	19,876	45	50,007		21,055	8,744	1,892	
Total.....	1,114	\$1,633,094	447	\$883,537	5,240	\$6,186,132	570	\$707,409	\$9,679,295	\$2,046,005	\$157,972
										\$194,417	\$76,700



# The FORUM



## Manufacturers' Parts Service Plan

Editor AUTOMOTIVE INDUSTRIES:

I have read the article "Parts Service Cuts Profits of Dealers" appearing in your issue of March 3 (page 534).

Our company was represented at the meeting held at the La Salle Hotel in Chicago referred to in your article, and as a member of the Parts Manufacturers' Committee conferred with the Truck Manufacturers' Committee.

As a commercial engine manufacturer, I would like to present the position of the Parts Manufacturer, as it appears to me. My company (The Buda Company) realized some time ago that eventually the parts manufacturer, with some exceptions, would be obliged to establish their own parts station, if their product was to be properly serviced. With this thought in view we established our first parts station some two years ago and have been gradually establishing new locations since that time.

The object of these parts stations is to provide an adequate stock of parts for all models of engines as have been and are at present manufactured by this company and the principal distributing points are located in zones where the greatest number of trucks using our product are located, and such sub parts depots located in that vicinity are under the direction of the principal distributing offices, much the same as the parts as are furnished by the electric and carburetor companies. Consideration should be given to the fact that these parts depots simply sell parts and do not undertake any work of placing them in the product of our manufacture.

The article starts with the assumption that parts stations of this character will cut into the profits of the dealers. I would like to point out that so far as our plan is concerned, we do not cut into the profits of the dealers, but rather we work closer and assist them so that their profits are increased.

I am very strongly of the opinion that the business should be handled through the dealer and he should be considered as the logical medium for distribution of parts. In our own case over 95 per cent of parts sold is done through the dealers, and it is only in cases where no dealer is established in a particular locality or in the case of the orphan truck that we deal direct with the owner.

Not a single objection on the part of the dealer to this method has been registered, in fact the dealers are enthusiastic over the service station idea, as it allows them to discontinue tying up a considerable portion of their working capital in repair parts and they are able to employ this money to better advantage in the sale of trucks. Supposing, for example, in a certain distributing center, there are located 15 truck agencies handling trucks equipped with a certain make of motor. It is certainly more economical for one parts station to maintain a complete stock of parts rather than have 15 stocks of parts maintained by the truck agents, probably none of which are really adequate.

Further, numerous truck manufacturers have been using certain units for 10 or 15 years. This unit has been improved as to design during this time, so that the

unit being supplied the truck manufacturer to-day may be entirely different from the unit that he used two, three or more years ago. Does the agent who has just taken on a line of trucks wish to carry repair part stock for models of trucks that are now using a redesigned unit when he can depend on getting his parts promptly from a service station, and the cost to him being little or no more than he would pay by purchasing direct from the truck manufacturer?

The second-hand truck is becoming a problem to be reckoned with; in fact, there are cases where good-sized fleets of trucks are operated, all of which have been purchased second hand. One of the first things a purchaser of a second-hand truck wants to know is where he can purchase repair parts for the different units in his truck. If he finds that repair parts are not easily available, he will not purchase this truck, but will purchase a truck where he has the assurance of getting parts promptly when necessary.

It may be argued by the truck manufacturer that the establishing of parts stations will cut him off from all profits formerly derived from the sale of parts. While this could seem to be true, it is recognized by the parts manufacturers that the truck manufacturer should be compensated in some way for this loss, and a plan was suggested at the meeting which seemed to solve this condition.

Such truck manufacturers who still wish to maintain their own supply of parts at their branches or in the hands of their distributors are at liberty to do so, and the parts station plan does not contemplate the elimination of such stocks if the truck manufacturer desires to maintain same.

The logical development of the parts station idea in the writer's opinion would be to have certain groups of parts manufacturers have their parts handled by the same organization. In this way one series of parts stations might handle parts for a certain motor, axle, transmission and clutch, while another series of stations might handle parts for another series of units.

The plan, if worked out on a broad basis, would tend to infinitely strengthen the position of the assembled truck manufacturer, as the purchaser of any make of assembled truck would know that he would be able to get necessary repair parts for any of his units promptly at any time.

Harvey, Ill.

THE BUDA COMPANY,

L. M. Viles, President.

## Fitting Traction Devices to Disk Wheels

Editor AUTOMOTIVE INDUSTRIES:

We have been much interested in the editorial on page 35 of your issue of Jan. 6, entitled "Fitting Traction Devices to Cast Disk Wheels." This editorial seems to assume that equipment for such wheels has not been designed by any manufacturers of traction devices, and that the difficulties connected with applying equipment to such wheels have not been solved.

As you know, many trucks equipped with disk wheels



were used by the army during the war, and our equipment known as No. 66 was designed particularly for use on army trucks. After the army had adopted this equipment the disk wheels furnished on trucks on their orders were drilled for the attachment of the equipment.

Some manufacturers of disk wheels are still furnishing their wheels with holes bored to fit this equipment. However, where disk wheels are not drilled in this way, it is a very simple matter to drill the six holes necessary on each rear wheel to accommodate this equipment.

GIANT GRIP MFG. CO.

## "Fuel Economy Comparisons"

Editor AUTOMOTIVE INDUSTRIES:

The truth of the general proposition that comparisons are apt to be odious has never been so forcefully presented to me as in a reading of your editorial comment under the title "Fuel Economy Comparisons," in the March 10 issue. These comparisons are the more odious because they will convey a half truth, or less than that, to many of your readers.

There seems to be but little justice or advantage in comparing the *overall* fuel consumption performances of tractors, involving their crudities of power transmission, and the great losses therein, with what is known to be an extra special performance of a highly developed aircraft engine operating *without power transmission losses*. Perhaps it was merely sought to set a mark at which the builders of tractor engines might shoot. But it must be recognized that the aircraft engine can show such results with only certain special grades of fuel. If aircraft engines were operated on commercial or car grades of gasoline, their performances would be very little if any superior to those of good tractor engines; and it is safe to say that their trouble-free working lives, under this condition, would be materially less than those of good tractor engines.

While it will not be attempted to argue that the results of the tractor tests named in your editorial are a credit to the tractor industry, it seems, on the basis of our own work with this class of engines, that the apparently poor showings discussed must be largely attributable to transmission losses, of which no mention is made in your comments. It is obvious that it is entirely unreasonable to have a mean consumption of 1.35 lb. b.hp.-hr. at rated load, considering the power to have been measured at the engine crankshaft.

Accompanying this letter is a graph of fuel consumption vs. per cent of maximum load, for four tractor engines,

operating at governed speed on both gasoline and kerosene. Two of these engines were valve-in-head and the other two L-head designs. It will be seen that in two cases the performances are superior on kerosene, on the basis of horsepower-hours per gallon (gasoline = .75 sp. gr. = 6.25 lb. per gallon; kerosene = .84 sp. gr. = 7.00 lb. per gallon). Assuming that a tractor engine is rated at 85 per cent of its full load capacity, these four engines stand as follows, on the basis of b.hp.-hrs. gal. and maximum B.M.E.P. developed:

ENGINE	KEROSENE		GASOLINE	
	B.H.P.	B.M.E.P. hrs./gal.	B.H.P.	B.M.E.P. hrs./gal.
(a) 4.50 x 5.50 x 4 cyl., overhead valves .....	12.05	83.0	11.15	84.5
(b) 4.25 x 5.00 x 4 cyl., overhead valves .....	11.29	74.9		
(c) 4.00 x 5.25 x 4 cyl., L-head .....	10.42	70.0	10.08	71.0
(d) 4.00 x 6.00 x 4 cyl., L-head .....	9.88	72.2	10.22	73.1

The test conditions under which these results were obtained were of the same order of excellence as those in the tests of the aircraft engine cited in your editorial comments. And the results cannot but lead to the conclusion that good tractor engines are not so far behind the best in aircraft engines, for which latter the value of 13.7 b.hp. hrs./gal. is admittedly a record.

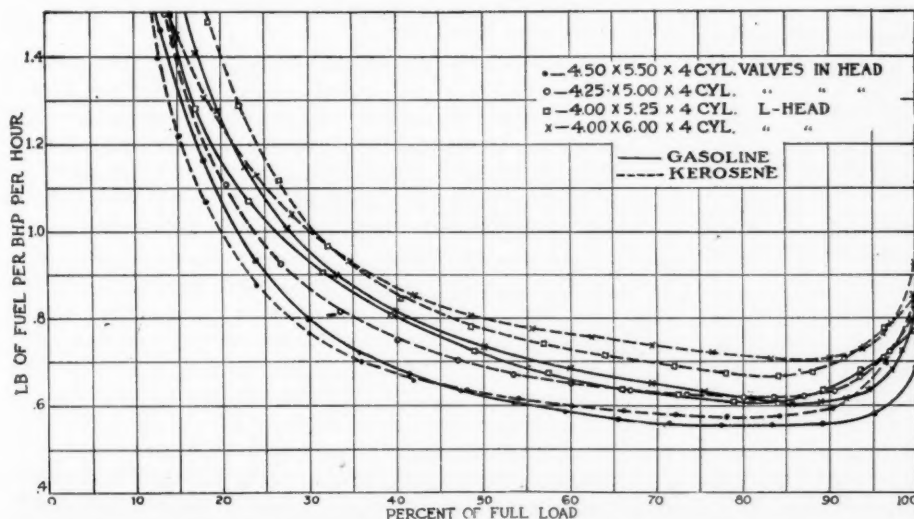
The writer holds no brief for kerosene or other heavy distillate as a general engine fuel, since the conditions that must surround its satisfactory use demand the best there is in engine design. It has often been found to be much easier, as a way out, to condemn the heavier fuels than to make the necessary reorganization in engine design details. However this may be, it is a certainty that the heavier fuel distillates are not quite the pariahs some would have us believe.

P. S. TICE.

## Automobile Electrical Systems

FROM the time that the first combined starting and lighting system made its appearance on the market, about 1912, many systems have been brought out and have disappeared; that is, these systems are no longer being manufactured, but in many cases they are still doing service in cars and have to be looked after by the owners or operators and repaired and overhauled by garages. In some instances the manufacturers have gone out of business and it is very difficult if not impossible to get detailed information on their systems, such as would be helpful in making repairs.

A book that should be of considerable help in such cases is *Automobile Electrical Systems*, by David Penn Moreton and Darwin S. Hatch, published by the U. P. C. Book Co. This is a sequel to the volume on *Electrical Equipment of the Motor Car* by the same authors and deals particularly with individual systems. It must not be understood from the above that only obsolete systems are described. No less than fifteen chapters are devoted to descriptions of special systems for Ford cars and nineteen to systems for general use. There are also chapters devoted to a general discussion of wiring diagrams, to the maintenance and repair of electrical apparatus and the diagnosis of troubles. The book is of pocket size and bound in flexible covers.



Fuel economy comparisons of tractor engines at governed speeds

# Standardization Without Understanding Is Harmful

Knowledge of the fundamental elements involved in human actions and relationships is so very limited at present, that attempts to standardize practice and methods of handling this factor are premature. Development lies in closer study of the elements. A noteworthy commentary.

By Harry Tipper

**T**HE following abstract taken from a New York newspaper may not appear to be interesting to the average business man and yet it is one of the symptoms of development in this kind of work that should be noted and considered in its relation to the study of the human side of industry.

Plans for standardizing methods of selecting men and women for vocations to which they are best fitted were discussed yesterday at a luncheon in the Keen Chop House, 72 West Thirty-sixth Street, and a committee appointed to go further into the matter, led by George Kingdon Parsons, president of The G. K. Parsons Corporation, who was the host.

The committee will confer with the Personnel Research Federation, organized in Washington last Tuesday at a conference of the National Research Council, attended by representatives of some thirty scientific and welfare societies.

Dr. Beardsley Ruml of the Carnegie Corporation agreed that what Mr. Parsons had said reflected a general feeling and described the origin of the Personnel Research Federation as a result of the conference in Washington a week ago. He said that the federation was still in a formative period and that he had been chosen as acting director. He added that it was planned for the federation to keep records of as complete a nature as possible regarding all agencies fitted for specialized research in connection with questions of personnel.

The first sentence in this article is perhaps the most significant because it is the general tendency of all organization work of an abstract character in connection with these problems. It states that plans for standardizing methods for selecting people were discussed.

This idea of standardization runs through all the discussions which have taken place in connection with the organizations of employment managers, personnel directors, industrial engineers and the innumerable other societies springing up with the idea of taking care of the human side of the industrial problem. I am reminded of the statement which I quoted about two years ago in one of the first of these articles:

"In their meagre imagination uniformity seems a lovely thing—when it is only the night in which all cows are black."

It is true that there are certain fundamental elements of similarity in human reactions, but the principal possibility of development lies not in these fundamental similarities but in the endless individual variation which develops an infinite variety in the quality of action and thought. We do not even know with any certitude the fundamental elements of similarity and what they mean in practical action. We have no understanding of the way in which these fundamental elements govern the

endless individual differences, and we are utterly without information as to the potential powers which exist in these variously combined qualities.

We have already standardized to such a degree in our attempt to use human beings easily in industry, that standardization has in many cases developed into a dangerous suggestion of uniformity. This standardization has grown up out of the ignorance of fundamental human requirements, and it has been one of the chief elements in the growth of trade unionism and the development of socialism.

All methods of examination of human beings which are standardized are inefficient to that degree—the most desirable method of selection, like the most desirable method of education, is the one which is individual and arises out of the instinctive capacity to draw the individual out.

As a matter of fact, this idea of standardization in human relationships is simply another way of attempting to do by system what we have not sufficient knowledge to do by understanding, and the result is likely to be more confusion and more difficulty, because these organizations of various kinds will be limited by the systems which they have adopted.

It is a sufficiently hard matter to standardize effectively the technical practice in a business which is dealing with understood mechanical principles. Every step in the progress of such technical practice demands the elimination of old standards and the readjustment of standards to the new state of knowledge. We are thoroughly well informed regarding mechanical principles, and are able to govern the results with a fair degree of accuracy and with a fair degree of foresight.

Our knowledge of humanity is meagre and we have not made any notable progress in this respect in the growth of our mechanical convenience. To attempt to standardize and to classify into systems in our present ignorance of human relations is to assume a knowledge which we do not possess and seriously impede the possibility of progress.

Equally significant is the indication in this report concerning three or four additional organizations with the sole object of establishing new systems of dealing with the human being. This multiplicity of organizations is leading already to a great deal of confusion and to the development of a large amount of unnecessary propaganda for this or that method of increasing the efficiency in dealing with the human side.

If these groups were based upon discussion and the gradual illumination of the matter by the definition arising out of the friction of the discussion there would be



some valuable progress in their development. Almost all of them have been formed by people who are not only interested in the subject, but who are also interested in certain systems of development—of which each system, of course, contains the only elements of thorough value in dealing with the situation.

Such organizations have a tendency to establish a terminology and a technique of operations long before they have thoroughly illuminated the principle upon which such a technique should be built. They may be of some value in a limited way, but their constant multiplication is of no advantage and may be a great disadvantage.

No operating technique or system of dealing with the selection or co-operation of workers is of any particular importance at the present time. The co-operation depends largely upon the development of a spirit of fairness among all parties, and the selection depends upon an increase in the measure of understanding on the part of those who must select. Selection must always take place because of the fitness of the individual for the work, in his skill and the quality of his mental development.

The total efficiency of the group is the average of the value of each individual in the group. A thorough understanding of the individual, his skill and his quality will automatically raise the average possible efficiency of the group, while neglect of the individual, in the attempt to standardize and provide easy systems for mass selection will merely bring the individual quality to the average upon which the system is based. Practically all of these organizations act as though the individual was no longer the basis of human development and efficiency was no longer a question of the individual capacity.

The very necessities of our organization have driven us to standardize work and pay, the unions have attempted to make skill a uniform matter and these things are disturbances enough to our present system of organization. To organize for the purpose of furthering these standardizations and elevating the neglect of the individual into a scientific technique, seems to be a method of improvement by increasing the present difficulties.

It may be imagined from this discussion of organization that I do not favor special study of the human side. This is not so. No man can expect to understand hu-

manity even in a slight measure without giving it a great deal of study. The lack of definite knowledge on the subject means, in fact, that this study is more severe and more laborious than any other study in the attempt to acquire definition. My objection is that these organizations are systematizing on too little study and too little understanding of the matters with which they are dealing. Their efforts at organization are based upon the most fragmentary and partial examinations of the matter.

The systems are not based upon much more knowledge than the course which undertakes to teach all about handling humanity in six months. In thirty centuries we have not been able to define the frame work of fundamental human principles and determine the elements of human co-operation. Under these circumstances, it seems unlikely that organizations can be started after a few months or a few years fragmentary study of the question and build up systems of operation which will be of great moment in dealing with the subject.

It would be better, for a time at least, if the systems grew out of the individual methods of operation in each case, and were discussed in the endeavor to find those principles which threaded through all systems. Some real progress might be made in an organization by such discussions and the understanding of the human side would be greatly forwarded.

It is not standardization we need, but definition. What is a square deal? I have been unable to secure the same definition from any half dozen men. Most of the time the square deal we talk about is concerned about what the other fellow should do to us, and doesn't refer very much to what we should do for the other fellow.

I have yet to find a dozen men who can agree upon the term fair wages. Efficiency, alertness, initiative and all these other words which we use to describe human qualities, lack definition entirely, and their meaning is so vague that no two men translate it into the same actions.

There can be no standardization of effort worth while without a definition of fundamentals so clear that the terminology is thoroughly understood. With the present vague, indefinite, fragmentary ideas of human quality and action, systems based upon such ignorance are not likely to be of any importance and they may be dangerous.

## Air Service Engineering School

A SCHOOL at which officers of the Air Service may learn the engineering principles of airplane construction, tests and maintenance is conducted by the Service. Requirements for admission include a rating as an air pilot and one of the following three educational tests: (1) Graduate of naval or military academy; (2) graduate of recognized technical college or (3) a thorough high school education and well versed in the fundamental sciences and exceptional experience along lines of special importance to the Air Service.

It is hoped that as a result of this instruction the student officers will get a point of view and a sufficient knowledge to allow them to speak the language of engineering and that a deep interest in mechanical matters will be instilled in them which will result in their returning to their stations with an educational foundation and an interest in technical matters which will cause them to continue reading, studying and constantly improving themselves as Air Service officers.

Following is a list of the topics covered by the course: Mechanics; Shop Work (machine tools, wood work, metal construction, plane construction and maintenance, inspection); Business Administration (scientific factory management, cost accounting, business law, patents, contracts, civil service); Armament (machine guns and synchronizers, bombs and flares, cannon); Strength of Materials; Materials Laboratory (chemistry, metallurgy, physical testing, wood, fabrics, rubber); Electricity (direct currents, alternating currents, miscellaneous airplane electrical problems, radio); Thermo-dynamics and Engine Design (heat engineering, steam power plants, radiators, engine design); Gasoline Engine Laboratory (ignition, power tests, general engine data and repair and upkeep, accessories and power plant installation inspection); Theoretical Aviation (aero dynamics, airplane design, propeller design, performance tests, airship theory, meteorology, navigation, airplane accessories, equipment, photography and instruments, camouflage).



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## Increasing Interest in Costs

AN increasing number of the letters received at this office are concerning the cost of manufacture and of merchandising. This indicates a healthy frame of mind as to business of the immediate future. There has been an inclination on the part of some persons, during the recent era of free selling, to conduct their business on the principle of "charge all that the traffic will bear."

If the signs that are pointing to the immediate future can be read at all, they say that the principle of business must be "charge as little as the traffic will bear." This means that the manufacturer and merchandiser must know what his costs are, add a reasonable profit, and put all possible energy into his work.

But when it comes to discussing costs there is an almost insurmountable barrier. There is lacking a recognized terminology of costs. When two men meet to discuss costs they do not call the same thing by the same name, nor do they charge it in the same

division. Cost discussions are not effective until the definitions have been fixed, and that takes so much time that the real facts are left undiscussed. The Industrial Cost Association, which is composed of cost executives, chief auditors, works managers and similar executives of manufacturing and mercantile firms, has undertaken to establish a terminology for cost accounting. The members of this association also hope to agree eventually on where the items represented by these terms shall be charged. When this is accomplished, the Association will have accomplished a great work, for then two men can meet and discuss costs intelligently.

## Automobiles and Necessity Again

A FREQUENT topic of conversation in the automotive industry is the great battle that was waged in Washington several years ago to establish the automobile, and its kindred vehicles, as necessities. In these conversations it is always assumed that this battle was won and a favorable peace treaty adopted.

There are some of us who have always doubted that the favorable verdict was as well grounded as it might have been. Now it appears that the "luxury" forces in this battle are comparable to the Germans. They recall something about this battle, but since the smoke was cleared away they are rather in doubt as to who was the victor. Indeed, some of them are calmly assuming that the battle was merely a skirmish with the laurel wreath awarded to the other side.

Representative James W. Good, chairman of the House Appropriations Committee, has put himself forth as spokesman for the luxury side and has sounded a call to arms for those efficient orators and economists who made such a good showing for the automotive industry at the time America went into the war. Mr. Good says:

"We have in the United States more than 8,000,000 passenger carrying automobiles. Practically every one is a luxury, and if we placed a tax upon the passenger carrying vehicles and made the amount of the tax dependent upon the horsepower, a reasonable tax, we could easily collect \$200,000,000 from that source."

That is an average of \$25 a year for each automobile, as Mr. Good presents the numbers, with enough additional tax to pay for the political machinery set up to make the collections—an average of \$5 a seat in an already well taxed automobile. All of this tax would act as a brake on the sale and use of motor equipment.

This statement from Mr. Good confirms what a number of investigators have said recently concerning the stand of bankers, legislators and others in a position to do the automotive industry great harm. C. C. Hanch, after an extended investigation for the National Automobile Chamber of Commerce, said that he had found that even the bankers, who appeared to be most soundly converted to the automotive industry, still held back in their minds a suspicion that the industry was not well established upon a necessity basis.



Mr. Good's statement should at least serve as a sufficient warning of what the position is in Washington and that most of the basic work thought to be completely accomplished must be done over.

## The British Tractor Trials

EVIDENTLY the British tractor industry has come to the conclusion that tractor trials are a paying proposition, for it has been decided to repeat the annual trial this fall. Originally the Lincoln trial was held under the auspices of the Royal Agricultural Society; last year that organization and the Society of Motor Manufacturers and Traders stood sponsor jointly for the event, but this year the last-mentioned Society will have sole charge. The joint sponsorship was accompanied by a good deal of friction, and as most of the tractor manufacturers are members of the S. M. M. & T. the latter body probably had little difficulty in securing exclusive control. Whether the farmers will have as much faith in the trials with the Agricultural Society excluded from the affair remains to be seen.

National tractor demonstrations, which evidently are a thing of the past in this country, are apt to flourish in Europe during the next few years. A national trial naturally has a much better chance of success in a country of relatively small area than it has here. Moreover, the tractor industries in the different European countries are quite young and the manufacturers individually (as tractor manufacturers at least) have little to lose and everything to gain.

From the rules of the British 1921 trials, which have just been received in this country, it is seen that an endeavor is being made to extend the scope of the trials, motor cultivators and garden tractors being provided for in addition to regular farm tractors, cable sets and farm implements. The tests which will be made will yield information similar to that given by the Nebraska tests, and the fact that the Nebraska results are available to any prospective purchaser is another reason why we are not likely to have national demonstrations in this country again, at least for some years to come.

## Save the Patent Office

THE last Congress adjourned without legislating for the benefit of the Patent Office. Because of certain quibbles between members of the Senate and the House, the Nolan bill died between these two branches of Congress.

The neglect of this important branch of the Government by Congress should stand as an indictment of every member of both branches. There is no branch of Government activity that can do as much to promote the engineering and mechanical development of this country as the Patent Office. Its best services are needed as an aid to the advancement of all engineering work and to the great task of efficient production.

The Patent Office is not an expense to the Government. It pays its own way and industry does not object to this fact. It would not even object to the

Patent Office making a safe profit on its operations. But industry does demand that the Patent Office shall be efficient, that it shall be permitted to spend enough of its own money to pay the technical men who work there a decent salary.

No other industry is more interested in an efficient Patent Office than the automotive industry. It would be within reason for every manufacturer and engineer in this industry to inform his representatives in Congress that unless proper Patent Office legislation is passed at the coming session, that the participants in the deliberations of the session will be classified as unfavorable to business interests.

This matter is important. Write to your Congressmen to-day before they again become involved in the activities of the coming session.

## Low Mechanical Efficiency at Part Load

AMONG the many factors which adversely affect the fuel economy of the conventional passenger car and truck engine, the loss due to engine friction is ordinarily considered to be of small moment. Broach the subject to the average engineer and he will as a rule draw attention to the fact that the mechanical efficiency of a well-constructed automobile engine is around 90 per cent, and so it is—at full load. At part load, however, the situation is quite different. Friction losses, in which are included the very important items known as pumping losses, do not decrease, at a given speed, as the load decreases. In fact, they increase, as a result of throttling, until at no load, that is with the engine running idle, they absorb the entire amount of power developed in the cylinder. At intermediate points friction losses become a very important factor. In the case of the class B truck engine, for example, at quarter load, when running at 1000 r.p.m. the brake hp. developed is about 12, while the friction hp. is over 6, or more than one-third of the total indicated power developed. At lower loads the condition is worse, especially if the engine speed is high. Yet these are the conditions under which the average passenger car engine operates most of the time it is in use.

Under the average operating condition, perhaps about one-fifth load, it frequently happens that half or more than half of the total power developed in the cylinder is used in simply turning the engine over. This is a bit startling, but it certainly points to the need, now more than ever apparent, of providing means whereby automotive engines can not only be operated at more efficient loads, but be run at lower average speeds, for friction losses in the engine increase rapidly as the speed increases. It may, in fact, prove to be better economy to use larger and slower speed engines together with high gear ratios and consequent better load factor, than to continue in the other direction, as we have so long been going. In any case there is food for thought along this line.

Too much is now being sacrificed in respect to fuel economy in order to secure good acceleration. This is a good time to investigate every factor that will make for better economy.

# Sales Show General Improvement

## New Orleans Finds Keen March Demand

### New Business Much More Stable Than Formerly—Tractors Gain in Favor

NEW ORLEANS, March 28—The first 21 days of the month of March showed greater improvement in the automobile industry than did the entire 30 days of any previous month since the first of November, 1920. The period of depression reached its lowest ebb in December, revived somewhat around Christmas and the holidays—due largely to the pre-Christmas show—and then dropped again in January. Sales for the first three weeks of March, however, exceeded those of October, 1920, the last month before the period of depression set in, by about 20 per cent, which is considered a remarkable showing by the majority of the sixty-odd automobile dealers in this city.

The return to the normal of 1920 was a surprise to many dealers, who had expected an improvement in the spring, but had not looked for so great an advance. Truck and tractor men, who have not felt the depression so heavily as the passenger car dealers, have not noted much of an upturn for March, though their sales have remained steady, and there are prospects that their business will improve later in the summer and this fall.

Greater diversification of crops, succeeding the hard lesson the one-crop cotton planters learned when cotton dropped from 45 cents to nine cents, is making the use of tractors and trucks almost imperative in the agricultural regions of the South, and is having a direct effect on orders for tractors for future delivery, but most of the planters are not in condition just now to accept immediate delivery on either trucks or tractors.

### Conditions General in South

These conditions, both in the truck, tractor and passenger car fields are true in much of Alabama, all of Mississippi and Louisiana, and parts of Arkansas and all of eastern Texas, which territory is tributary, in the automobile industry, to New Orleans. While the farmer has not made much money on his cotton, sugar or rice, the brokers, forwarders and other intermediate handlers of these crops have made some money; salaries in these industries, for the majority of those who work in them, have remained high, and the consequence is that numbers of the city people have been able to buy passenger cars, and have bought.

(Continued on page 729)

## TRADE STUDY SHOWS INCREASES GENERAL

Dispatches from correspondents of AUTOMOTIVE INDUSTRIES in representative sections of the country indicate steadily improving sales conditions. The improvement this month has been much more marked than was expected.

For example, the first three weeks of March showed a greater improvement in the New Orleans district than any full month since November. There also is a steady upward trend in the Atlanta territory.

Even in Des Moines there has been a great improvement. One distributor sold more cars the first 15 days of this month than in all of January and February.

General merchants in the rural districts of Kansas and Missouri report improved business.

Sales conditions are getting better on the Pacific Coast, as shown by reports from Los Angeles and Portland.

Dealers in Montana have decided there is business if they have the energy to go out and get it.

Sales in New York, which fell off during the income tax paying period, have begun to mount again.

Parts makers in the Milwaukee district report substantially increased orders in the last four weeks.

Cleveland and Detroit passenger car manufacturers are adding more names to their pay roll. The same condition prevails in other automotive centers.

Altogether the situation is decidedly encouraging.

## UNEMPLOYMENT HURTS SALES

FORT WAYNE, IND., March 26—Sales of popular priced cars are picking up to a certain extent here, although it is still difficult to make sales readily. It is believed that business here and in this generally prosperous northeastern section of Indiana will get much better within a few months. At the present time the fact that so many people are out of work locally makes business far from good. The local branch of the Indiana free employment bureau reports that there are 4000 more men out of employment there now than there are at normal times. Most of these men are from the Pennsylvania shops, General Electric Co., Dudlo Manufacturing Co., Fort Wayne Rolling Mills and Wayne Knitting Mills, where a strike is on.

## New York Visions Big Selling Months

### Effect of Income Tax Period Passes Quickly—Cheaper Cars Popular

NEW YORK, March 28—The metropolitan area is recovering from an acute attack of incontinence, which slowed up passenger car sales, particularly in the high priced lines during the early part of March. Sales, which dropped off from the February level during the first 20 days of this month, have begun to pick up again and the prospects for April, May and June business are bright.

As an instance of the psychological effect of the filing of income tax returns and the payment of the first installment, One dealer handling a \$3,000 car had sales during March numbering 51, as compared with 86 during February. Several other dealers in high priced cars had similar experiences, though two or three with decidedly popular makes had a March business considerably better than February. The income tax period seems to have had little effect on the sales of low priced cars and in several lines these are running very strong. One dealer in a popular priced car had sales for March running only a little below 200, as compared with 150 in March a year ago.

Practically all dealers have intensified their canvassing and mail solicitation efforts, and several have been added to the list who keep their establishments open evenings, with good results so far, according to reports. The junior salesman idea, under which quite young men are used to develop information on prospects later to be canvassed by senior salesmen, is spreading and general good results have been obtained. Used car sales prospects have picked up with those in the new car line, despite the fact that used car prices have shown little disposition to decline.

Truck sales have improved materially in the light truck classes, and there is an upward slant in the heavier duty field.

### EARLY SPRING HELPFUL

PORTLAND, ORE., March 25—The early spring has proved a distinct boon to the automobile industry in the Portland district and during the past week business has picked up in a decided manner. Spring this year promises to be nearly a month in advance of last year and the country motoring should start correspondingly early. Comparatively few cars are held in storage here and dealers have been placing orders with the manufacturers during the past two weeks in a more substantial way.



# Factories Reflect Growing Demand

## Milwaukee Factories Report Steady Gains

### Capacity Production Within Sight in Some Plants—Truck Demand Certain

MILWAUKEE, March 28—Companies in Milwaukee and vicinity manufacturing motors, parts and equipment for the automotive industries report a substantial increase of orders during the last four to six weeks, according to the current issue of Business and Financial Comment, monthly review of local business conditions issued by the commercial service department of the First Wisconsin National Bank of Milwaukee. One concern reports that its January sales were equal to those of the same month in 1920; its February record is better still, and March business shows accentuation over both. This concern is running at 85 per cent of capacity, and orders for immediate shipment are of such volume that it is two weeks behind in deliveries.

It is significant that the stimulus which brought this new business was a substantial cut in prices made possible by lower costs. Another company making motors has recently received some good-sized orders for immediate delivery. Still another large firm doubled its sales in February and expects enough business in April to run at full capacity.

The motor truck business seems also to be on the mend. Orders have been increasing and there are almost no cancellations. The truck industry is, however, not taking anything for granted. Selling trucks may be hard work, but the future of the industry is assured, the review says:

#### Must Distinguish Between Prospects

"In discussing the motor car situation, one must be careful to distinguish between immediate and long run prospects," it continues. "Everybody knows that there will be a good future market for passenger cars and also that motor trucks are pretty sure to be more in demand as more good roads are built and farmers and business men are convinced of the economies of motor truck transportation. In the immediate foreground manufacturers see about 50 to 60 per cent of the business done last year. One production manager puts it well when he says that 'the automotive industries are facing a sales problem after twenty years of production problems.'

"Some discontent is being expressed at the slowness of trade improvement. General revival, at first predicted for early spring, is now scheduled for late

spring or summer. The best opinion is that the return of normal conditions will not be in the least spectacular. Each month will see steady gain. By the end of the year, barring the unforeseen, business should be on its feet again. It is not good sense to look for the fortuitous and unexpected in business. This is not real optimism. The confidence of reward from unremitting toil is the only kind of optimism that has any certainty of winning. The sooner everybody in trade and industry makes up his mind that he will have to work for what he gets, the easier it will be to get over this period of readjustment."

## Los Angeles Business Makes Rapid Strides

LOS ANGELES, March 29.—Automotive sales conditions in this part of the country are showing a pronounced improvement. Passenger car business is advancing quite rapidly and truck sales likewise are showing increased activity. There is a certain backwardness shown by truck buyers, however, that is attributable to prospects of unfavorable legislation. Some bills now before the state legislature would tax truck owners very heavily.

A recapitulation of February registrations of passenger cars shows that some Los Angeles firms enjoyed the greatest business in their history. A total of 1913 new passenger vehicles were registered by purchasers during February. This was 145 less than the total for January, but this discrepancy undoubtedly was due to February being a short month. The truck registrations for Southern California during February totaled 277, which figure included the Fords and other light commercial cars.

Reports from dealers state that March will show a pronounced improvement over February in almost all lines.

## VICTOR RUBBER SPEEDS UP

SPRINGFIELD, OHIO, March 28—Starting to-day, the Victor Rubber Co. will speed up its output to a normal basis, which is 500 cord tires per day, according to announcement made by Treasurer H. H. Durr. Since the first of the year the company has been turning out an average of 400 tires daily. The business of the company has been steadily improving, it is stated.

## PIERCE OVER 50 PER CENT

BUFFALO, March 28—There has been a substantial improvement in the business of the Pierce-Arrow Motor Car Co. so far as passenger cars are concerned but few trucks are being sold. The company is operating at something over 50 per cent of capacity.

## Schedules Increased in Cleveland Plants

### Growth of Sales Results in Re-employment of Many Men Laid Off

CLEVELAND, March 28—Within the present week the automobile factories in this city have given signs of a business revival and have restored several thousand employees to positions that they left weeks ago. The automobile industry is setting the pace for a general comeback in production in this city.

The Peerless Motor Car Co. is employing 1500 men, and the number is being increased daily. Orders have come in increased number each week since the first of the year. More than 150 men have been hired in the last 30 days. The company is now increasing its force by taking on 10 to 15 daily.

At the Jordan plant the statement was made that more automobiles are being shipped than the company is building at the present time. Although the pay roll has not been increased since the first of the year, the force of employees will be augmented on April 1.

The Chandler Motor Car Co. started on Feb. 1 to increase its working force. During March a marked addition was made to the pay roll. The week of March 21 to 28 brought about a substantial increase. The company expects to see pre-war conditions restored before the spring ends.

The White Co. has added no employees since Jan. 1. Working hours were decreased since then and shifts have been shortened in order to give as many employees as possible an opportunity to earn money. While other companies were curtailing production the last half of 1920, The White Co. operated at capacity. Prospects at this plant are brightening daily, it was said.

## Harvester Employees Agree to Reductions

CHICAGO, March 25 — The Works Council, as the supreme body governing the operation of the International Harvester plant, has accepted the company's proposed cut in wages of 10 to 20 per cent. Reasons for the reductions were explained to the council at a conference with officials.

Wage reductions were decided upon by officials of the company after analysis of business possibilities, working conditions and the present cost of living. In determining for reductions in wages it was agreed that the cut should be made indiscriminately, affecting everyone from the president down.

# April Schedules Revised Upward

## General Expansion Meets Sales Trend

### Dodge Makes Increase to 60 Per Cent Capacity—Expectations Surpassed

DETROIT, March 28—Rapid improvement in the automotive industry is reflected in the big step-up in production in most of the factories in and around Detroit. This is true particularly in the case of Maxwell-Chalmers, Studebaker, Hupp and Dodge. The only instance where there has not been increased production is at the Reo Motor Car Co. at Lansing where the time and working force were cut 50 per cent last week. This, however, was not due to sales recession but rather to permit factory readjustments. Return to a full time schedule is expected next week.

Dodge opened on a 10 per cent schedule recently, but last Thursday started on a 60 per cent production basis, which means close to 400 cars daily. Arthur T. Waterfall, assistant general manager, made the announcement regarding the production increase.

"The country is well out of the depression," said Waterfall, "and even in foreign countries conditions that have affected the automobile industry are beginning to improve. We are now operating on a 60 per cent basis with all indications pointing to a gradual return to normal. That is the best indication I can give of a change for the better. Other lines of business seem to be following the turn in the automobile industry."

Charles Adams, production manager of Maxwell-Chalmers, said to-day rapidly improving conditions had brought about a readjustment of Maxwell-Chalmers schedules, and with the step-up during the last part of March, the total figures for the month would show an output of 1500 Maxwells and more than 500 Chalmers. This schedule will be increased the first of April, and efforts will be made to reach a total of about 300 cars in the next month.

### Cars Sell Fast as Made

The best feature, Adams said, is the fact that the cars are being sold as rapidly as they are being turned out. Maxwell-Chalmers virtually has been closed down for several months pending reorganization activities, but the sales demands, Adams said, forced the increased schedule in February, followed by another increase in March, with indications that within the next 40 to 50 days both plants will be running close to normal.

The completion of the new pressed

steel plant, which now is about ready for manufacturing activity and which covers 217,000 feet, will take care of the work for both Maxwell and Chalmers cars, and will permit of greatly increased production. The main building contains two craneways each with a double row of presses 300 feet long, and each equipped across its entire span of 60 feet with a crane capable of picking up material, or even the presses themselves, and moving them to any other part of the building. The presses are so placed that the steel passes from one to another without the need of extra men, and the working force is thereby greatly curtailed.

### Hupp April Schedule, 2000

Hupp Motor Car Corp., which built 700 cars in February, increased the schedule in March and the month probably will close with a total around 1400. April schedules at Hupp called for a production of 2000 cars, which rapidly is nearing the peak of last year.

Hupp officials a short time ago announced that while the factory had not been closed throughout the depression and was increasing gradually, there was nothing to indicate that production above 50 per cent of normal would be reached this year. Sales activity, however, has shattered that belief. The more than doubling of production during April, as compared with February, and the great increase over March, is due entirely to sales demand.

Studebaker to-day started in on a production in the Detroit plant of 800 cars for this week, and 500 in the South Bend plant. Next week Studebaker has scheduled 830 cars in Detroit and 575 in South Bend. "And the best of it is they are all being sold," said A. J. Chanter.

Buick Motor Co. at Flint, which had been employing about 12,000 men on a three-day a week basis, to-day started a schedule of 5½ days a week. This will mean that Buick in April will almost double its production. Buick was building about 200 cars a day in February and March, and indications are that the April schedules will run between 350 and 400.

Operations in the Hudson plant were resumed to-day upon a 100 per cent basis. The company has been operating with a curtailed force on a reduced working schedule for several months.

### Federal Truck on Increase

Federal Motor Truck Co. is another Detroit factory that has made a remarkable jump in production in the last few days. A full time operating schedule was announced Saturday by M. L. Pulcher, vice-president and general manager, who said the plant beginning to-day would be on a 50 per cent basis.

## Durant Takes Over Long Island Plant

### Former Ford Assembly Factory to Supply Eastern States and Export Trade

NEW YORK, March 28—Production of the new Durant car which will be put on the market about August 1, will begin in the eight story factory building of the Goodyear Tire & Rubber Co. in Long Island City which has been purchased by the Durant Motor Co. of New York for \$2,000,000. Preliminary operations already have been begun and the first cars will be under test in a few days.

The first real estate acquired by W. C. Durant for his new venture was erected by the Ford Motor Co. for an assembling plant but later was sold to Goodyear. It is located at Jackson Avenue and Honeywell Street. The structure has a floor area of approximately 500,000 sq. ft., is of reinforced concrete and steel construction, and is located on the Long Island Railroad. Not all the space will be required by Durant for some time to come.

The main plant of Durant Motors, Inc., will be located in Flint, Mich., but negotiations for its construction still are pending and considerable time must elapse before a factory can be established there. The Long Island City factory will be one of a chain of independent organizations to be located at strategic distribution points. It will be operated by the Durant Motor Co. of New York, a \$3,000,000 corporation, and each assembling plant will be under the control of an individual company to be operated under contract with Durant Motors, Inc., which will supervise and direct the production.

When operations are fully under way it is expected 25,000 Durant cars a year will be assembled and shipped from the Long Island City plant, which will supply the New England and Atlantic Coast territory and the export trade.

### Details of Car Not Available

No details are available as yet concerning the new Durant, but it will be largely an assembled product and will be made in two models, one of which will sell at something less than \$1,000. It is being designed by the designers of the Chevrolet.

The capitalization of Durant Motors, Inc., the parent concern, is \$5,000,000, consisting of 1,000,000 shares of no par value. The initial offering made in January amounted to 500,000 shares, which was immediately over-subscribed at a price around 12. The stock now is selling on the curb at 21.



## Ford April Orders Approximate 90,000

### Predicts Time for Full Operation Near—Financial Position Much Improved

DETROIT, March 28—Ford Motor Co. orders total approximately 80,000 for March delivery and 90,000 for April, according to figures furnished by Henry Ford personally, while on the trial trip of the Dearborn, his gasoline propelled railroad coach. That means, he said, that nearly every car and bit of finished stock on hand when the depression set in has been sold.

"The time is not far off," he declared, "when we will have to begin full operation to produce new cars and new parts to take care of the host of orders that come rolling in. Indications are manifest," he asserted, "that the bottom of business depression has been reached and passed, and the trend of industry is now definitely upward."

The annual report of the Ford Motor Co. for 1920, filed at Lansing, shows total assets of \$384,554,941, as compared with total assets of \$332,998,121 in the report for 1919. All of the outstanding stock in the company is shown held by the Ford family—Henry Ford, 95,321 shares; Edsel B. Ford, 71,911, and Clara J. Ford, wife of Henry Ford, 5413 shares. The amount outstanding totals \$17,364,500 of \$100,000,000 authorized.

Chief items shown on the balance compared as nearly as possible with similar items in the 1919 balance sheet, are as follows:

#### CHIEF ITEMS OF BALANCE SHEET

	1920	1919
Real estate .....	\$50,861,000	\$54,975,541
Cash in banks.....	13,557,244	
Credits owning corporation .....	54,438,633	156,011,984
Merchandise equipment, &c....	124,350,295	100,612,925
Goodwill .....	21,262,833	
Investments .....	20,084,033	20,903,512

Large sales of cars in the past few weeks have put the company on a much sounder footing than the annual report might indicate. The position now is considered so good by officials at the factory that they think it quite probable no bank loans will be required at present. This possibility was indicated in AUTOMOTIVE INDUSTRIES in the report of negotiations between Ford and New York financial interests.

It is also declared to be likely that when the \$35,000,000 in Federal taxes and outstanding bank loans become due May 1 the company will be in a position to meet the demands in cash. In the event that recourse has to be made to bankers, Mr. Ford has been assured that ample funds may be had. Recent short extensions granted by New York and Detroit bankers are said, however, to be the last for some time.

#### Ford to Make Plate Glass

ROCKFORD, MICH., March 26—Henry Ford's new factory here will begin the manufacture of plate glass within

a few weeks. Equipment is on its way from the Highland Park plant, where it was made, and engineers are preparing to set it up quickly.

Chemists recently made a survey of the silica deposits in the vicinity and reported them particularly suitable for making glass for Ford cars.

Mr. Ford's engineers say they have a new method of making plate glass which is cheaper than ever before known.

#### Ford Irish Plant Closed

CORK, March 28—Fifteen hundred workers have been made idle through the closing of the Ford Tractor Works here. It was stated that the plant might be shut down for several months.

### Ford Railroad Coach Damaged in Accident

SPRINGFIELD, OHIO, March 26.—Henry Ford, owner of the Detroit, Toledo & Ironton railroad, had visions of a high speed inspection trip over the road this week, but was disappointed owing to an accident to his new gasoline propelled railroad coach which was derailed at Quincy, north of here. The trial trip of the coach known as the Dearborn, was made Wednesday out of Detroit.

The new coach, which is equipped with a high power engine, was going at a mile-a-minute clip when it had to be stopped near Jackson Center. As it was approaching the Big Four railroad crossing at Quincy the brake on the Dearborn failed to work and the car went through the derail, but Ford and party including his son Edsel Ford, escaped injury. The car was pulled back on the tracks and the journey southward was resumed under difficulties.

On Thursday the Dearborn met the party at Kingman and continued the inspection trip south. At Jeffersonville more engine trouble was experienced and the party secured automobiles and returned to Springfield. On Friday the party started for Detroit, the coach being hooked on behind a steam locomotive. It is expected that Ford will make another test of the car as soon as the engine is put in condition again.

It has a seating capacity of 50 and resembles a street car.

### Ford Plant Increases Tractor Production

DETROIT, March 28—Tractor production at the River Rouge plant of the Ford Motor Co. is now progressing at the rate of 150 machines daily. A rate of 100 daily had been continued to March 1 when this was stepped-up to the present figure. Officials say tractor demand is increasing largely and shipments have been made to New York, Pennsylvania, Massachusetts, District of Columbia, North Carolina, Indiana and Wisconsin. Michigan is taking hundreds of tractors, all of which are being driven away from the factory.

## N. A. C. C. Committee to Work with Hoover

### Accepts Suggestions to Form Part of Advisory Board—Will Study Markets

WASHINGTON, March 28—Herbert Hoover, Secretary of Commerce, has announced that automobile manufacturers will be the first to co-operate with his department in obtaining accurate statistics of production, consumption, exports and other details. He has taken up with J. Walter Drake, chairman of the foreign trade committee of the National Automobile Chamber of Commerce, the question of appointing a small committee to represent the industry in its relations with the Department of Commerce. The suggestion will be accepted and a committee will be named in a short time. This committee will form a part of Hoover's advisory board, which will consist of representative business and industrial leaders. The work of this board will be supplemented by that of service committees from the trade associations.

One of the plans proposed by Hoover is a survey of world markets to ascertain the best fields for commodities available for exportation from this country. He believes that a scientific survey of world markets is one of the pressing trade needs of the country. The first survey will include foreign markets with respect to automobiles, cotton and cotton products and a few other commodities. Government commercial officials abroad will be requested to report all available data as to the trade possibilities for particular commodities in the principal foreign markets.

It is the intention of Secretary Hoover to obtain full information direct from producers and distributors as to production costs, credits, financial standing, trade routes, markets, transportation, surpluses here and abroad, dumping and other important subjects. Whatever legislation may be required to assist in the promotion of trade will be recommended to the Congress by Secretary Hoover after he has studied the problem thoroughly.

#### Export Interest Keen

Automobile exporters have evinced a lively interest in the efforts of the Department of Commerce and the Federal Reserve Board to lessen the damaging effects of cancellations. Complaints have been received by the Department of Commerce of cancellations which put American manufacturers in a delicate financial condition. The Federal Reserve Board believes that uniformity in foreign trade and foreign banking practice is essential to minimize the possible scope of cancellation of orders and in order to fix more definitely the responsibility of banking institutions which have opened confirmed credits. It is stated that advantages would accrue through emphasizing the binding force inherent in commercial letters of credit.

## Tractor Factories Increase Production

### Minneapolis Finds Business Far in Excess of Expectations Earlier in Year

MINNEAPOLIS, March 26.—As a part of an enlarged program for the manufacture of tractors, the Minneapolis Steel & Machinery Co. will reopen its foundry early next week, it is announced by George M. Gillette, president. One hundred to 200 additional men will be employed, this number to be increased gradually.

"We have an order for every tractor we have made," said Gillette. "Our people feel that the business situation is greatly improved. Trade is far beyond the expectations of sixty days ago."

Demand for tractors for spring farm work is good in sections where the crops matured early last year and where the growers had the opportunity of selling before the slump in the price of farm products came, Gillette said.

This company recently made a shipment of tractors to Venezuela and Czecho-Slovakia, but, according to Gillette, no great improvement in the export business is anticipated until rates of foreign exchange become more normal.

Other tractor firms in Minneapolis report good business.

The Shaw Enocks Tractor Co. is operating its plant on a twenty-four hour basis, turning out tractors for road maintenance work. Many of these machines are being sold direct to county commissioners.

Reports received from dealers indicate that there will be a marked improvement in the demand for tractors after the first of the month, according to R. C. Brewsbaugh, sales manager of the Toro Motor Co.

### Plenty of Farm Funds, Says Wisconsin Banker

JANESVILLE, WIS., March 28.—Formal announcement of a 20 per cent reduction in the price of the Samson Model M tractor, and 10 per cent in all power plows and harrows was made at a big Farmers' Day demonstration at the works of the Samson Tractor Co., division of General Motors, in Janesville, Wis. More than 5000 people, mostly farmers, were present. President James A. Craig, in announcing the reductions, which make the list price of the tractor \$995 instead of \$1250, said:

"The cost of production does not justify these reductions, but they are effected to meet the popular sentiment among farmers and dealers to help bring conditions back to normal as rapidly as possible. During the day there were talks by bankers and business men. F. H. Jackman, president of the Rock County National Bank of Janesville, said: "There has been a lot of loose talk

about Janesville banks not lending money to farmers. I do not know of a single instance of a farmer in need of money being refused reasonable money credits.

"Any substantial farmer who needs money to buy tractors, implements or motor cars can get it at Janesville banks. There never have been any regulations put on the lending of money to farmers. We realize that banks are dependent upon farmers as well as business men and so much so to the former that we never have been inclined to discriminate against them."

### Southeastern Towns Show Steady Gains

ATLANTA, March 26.—The automotive industry continues its gradual but steady improvement throughout the Southeast, especially among the dealers in the smaller towns who, for the first time in some months, are beginning to report something substantial in the way of sales. Since the first of March a number of Southeastern newspapers have published Associated Press dispatches emanating from some of the smaller towns in Alabama, Georgia and Tennessee, the gist of which indicate that the automobile business in the small towns has taken on a brighter tone, that real sales are being made and that there is a much better feeling among the small dealers as regards the outlook for the future.

Distributors in Atlanta report a substantial increase in the volume of business during March as compared with the two previous months, with the promise that April and May will see the industry in this section more nearly normal than it has been since the period of depression first made its presence felt last fall.

### HART-PARR GIVES BONUSES

CHARLES CITY, IOWA, March 29.—The Hart-Parr Co., manufacturers of tractors, distributed to its employees who were eligible under their continuity-of-service participation plan for 1920, checks for their share of the 1920 business of the factory at a banquet given Friday evening. The bonus plan applies only to employees who have been in continuous service for a period of two years prior to 1920. Checks were given to individuals ranging from \$10 to \$500 each according to the length of period of continuous service with the company.

### TO FORM REVERE COMMITTEE

FORT WAYNE, IND., March 28.—An abandonment of the bond sale plan for the saving of the Revere Motor Car Corp. of Logansport has been announced by the board of directors. A committee will be selected to draft a reorganization plan, it is said. Attorney M. L. Fansler, of the company, said that at least one member of the committee will be a resident of Logansport. Another will probably represent the Chicago interests, another the southern Indiana interests and another the eastern stockholders.

## First Akron Plant Starts Three Shifts

### American Rubber Begins Maxi- mum Production—Other Fac- tories Ready for Increases

AKRON, March 25.—The fact that the American Rubber & Tire Co. has gone to maximum production with three eight hour shifts at work in the plant, is taken here as an indication that the dealers have begun to feel the shortage of tires predicted during the last month. The company is working the maximum number of men and is producing 600 tires a day. Practically all the orders which have occasioned the increased production have come from the dealers. H. L. Houk, general manager, said in a statement to-day:

"We do not care to say that we will continue on this basis indefinitely. We are proceeding with cautious optimism. We will if business continues as at present. We made no strenuous fall efforts to sell tires for spring delivery, and as a result our dealers are badly in need of tires."

Other companies are known to be making plans to increase production, and announcements are expected daily. Many of the companies have received large orders from the automobile manufacturers who are resuming production.

### Oshkosh Truck Reports \$4,000,000 Rush Order

OSHKOSH, WIS., March 28.—A contract involving approximately \$4,000,000 worth of quadruple drive motor trucks has been closed by the Oshkosh Motor Truck Co., and will be put into production immediately, according to official notice given stockholders. The company recently completed a new plant costing about \$250,000 and the contract will require a capacity of four trucks a day for twelve months.

This output will go to a large distributor, the name being withheld for the present because of a reorganization now being effected. It calls for both commercial vehicles and special fire fighting apparatus. The Oshkosh company intends to start work on a second unit, 50 x 200 ft., which was to have been erected last fall but was postponed because of conditions in building construction as well as the general situation in the motor truck industry.

### HARVESTER PLANT BUSY

SPRINGFIELD, OHIO, March 26.—The busiest place in Springfield is the Springfield works of the International Harvester Co. It is now turning out 50 high speed motor trucks per day. These are being shipped about as fast as they are manufactured. The men identified with the works state that there is a general demand for the motor truck. About 1000 men are employed at the local plant.



## Minnesota Licenses Based on Car Price

### Decreases Allowed Under New Bill for Cars Three Years in Service

MINNEAPOLIS, March 26—The Child's motor tax bill fixing automobile license fees in Minnesota under the Babcock good roads amendment has been passed by the lower branch of the Legislature without a dissenting vote and indications point to its acceptance by the Senate next week. The bill provides a tax within the average of \$18, as promised by the proponents of the amendment at the last elections.

According to the measure, the tax for passenger cars is fixed at 1.8 per cent of the factory price and for trucks at 2 per cent. The minimum tax on passenger cars under 2000 lb. is \$12 and over 2000 lb. \$15. The minimum on trucks is \$15, with an increasing scale for heavier vehicles. Decreasing fees based on percentages of the original price are provided for cars after three and five years' service.

These license fees are in lieu of the present tax and the personal property tax.

Based on figures compiled by a sub-committee, the bill will yield \$4,939,344 from passenger car licenses, \$600,000 from trucks, about \$500,000 from chauffeurs' licenses at \$2 each, and an undetermined amount from trailers, motorcycles, bicycles and other vehicles.

The tax was computed to raise \$3,000,000 for maintenance and \$2,840,000 to meet Federal aid for road construction.

### BAY STATE PROTESTS NEW FEES

BOSTON, March 26—For nearly seven hours this week the Joint Committee on Ways and Means at the State House listened to arguments for and against a proposal to increase the State fees for motor vehicles, as proposed in a bill submitted by the Department of Public Works.

Chairman Cole of the Department of Public Works, spoke nearly two hours, giving an exhaustive analysis of the problems of his department and of the costs of building highways and their maintenance.

Showing that the industrial life of the State depends upon transportation, he said that the railroads have lost the short haul work, which has been taken over by the trucks and that hereafter the railways must depend upon long hauls.

### KILL CAR COMPENSATION BILL

ALBANY, March 26—The Assembly Committee on Labor and Industry to-day returned an adverse report on the Stitt motor vehicle compensation bill which provides for compensation for personal injuries or death from the operation of motor vehicles and for obtaining payment as a condition precedent to registration of motor vehicles.

## FINANCIERS DECLARE CARS HAVE MADE GOOD

NEW YORK, March 28—The current issue of *The Financier*, a magazine going to several thousand bankers, contains a long article under the title, "Rural Bankers Find Cars Are Business Builders." It states that thrifty country bankers are enthusiastic motorists because by their use of automobiles they can save much valuable time. The article also quotes prominent New York bankers who have declared the automotive industry has made good. The list includes J. P. Morgan, George E. Roberts of the National City, A. Barton Hepburn of the Chase National and Francis H. Sisson of the Guaranty Trust.

## New Orleans Finds Keen March Demand

(Continued from page 724)

The attitude of the banks toward automobile paper—though possibly not toward automobile credits—has become more free. That is to say, it is easier for the salaried man in good standing in a community to obtain the backing of his bank in the purchase of an automobile than it was three months ago, but it is just as hard for the dealer or distributor to get a large amount of credit to handle a number of automobiles as it ever has been.

The reason for this is not just clear, but it appears to be that the banks are treating the automobile dealers on a strictly business basis rather than as a sort of gambling prospect, as they were treated up to about a year ago. This very action by the banks seems to have created a healthier condition among the dealers themselves. Buying an automobile nowadays in the country tributary to New Orleans is much like buying a piece of valuable real estate, or a houseful of furniture, in that the dealer is 100 per cent more careful.

### Payments Made in Shorter Time

This means that more passenger cars are being paid for in shorter time, and more promptly than ever before, since the dealer—unless he be of long standing and full of capital—has to have money of his own with which to get his cars out of the railroad terminals. Consequently, he calls on the individual buyer, not only for money down but for larger and more prompt payments.

The new Foreign Trading Corp., the bank formed under the Edge Act recently, to aid shipments of Mississippi Valley manufacturers to foreign ports, is extending assistance to automobile shipments with about the same freedom as to cotton and to other manufactured goods, so that considerable shipments of cars are going forward, especially to Latin-American importers.

## Underwriters Drop Fixed Value Risks

### Fire and Theft Losses in Future to Be Adjusted on Value When Lost

NEW YORK, March 28—The National Automobile Underwriters' Conference has unanimously passed a motion to abandon the valued policy for fire and theft risks. The measure takes effect May 1.

The value policy is one in which the amount of insurance is specifically named instead of depending on an adjustment to determine the actual value of the automobile at the time of loss. During the recent decline in values insurance companies found themselves carrying insurance far in excess of market values. This is a dangerous situation, as it makes the companies most tempting "customers." Statistical analysis attributes much of last year's heavy losses to this evil.

On the ground that tires, motor meters and spare parts are also poor moral risks and that insurance losses are suffering from the multiplicity of claims they involve, many companies will not include them in the policy. The conference declined to make this compulsory.

The National Automobile Underwriters' Conference has decided to continue writing full coverage on automobile collision insurance. The majority of the fire insurance companies disapproved making the deductible clause compulsory, but recognized that rates would have to be increased for full coverage, and instructed the rate and statistical committee of the conference to determine the proper rate revision upward.

## Tampico Oil Fields Offer Big Tire Market

TAMPICO, MEXICO, March 28.—According to George N. Anderson, sales manager for the Goodyear Tire & Rubber Co. for the northern district of Mexico, no area of corresponding size in the world offers a better market for automobile tires and accessories than Tampico and the adjacent oil fields.

"In the Tampico district," said Anderson, "there is an enormous demand for tires. This comes from the fact that here as nowhere else is time considered as of such great importance, and from the further facts that roads are bad, shelter not to be had, and drivers reckless."

"But there is strong evidence of a tendency toward economy in the use of automobiles. Buyers are talking quality now as never before and accessories, particularly tire savers—patches, boots, etc.—are being used more than ever before. The conditions in the automobile trade are becoming much more normal."

There are more motor trucks employed in the Tampico district than in all the rest of the Republic of Mexico.

## British Cut Prices Despite Guarantees

Vauxhall and Rover Choose Refunding Money to Losing New Car Sales

LONDON, March 20—(*Special Correspondence*)—While no general landslide is occurring in the prices of British cars, notifications of reductions are occasionally being issued. One of the biggest drops recently announced is that of Vauxhall cars, the decreases range from £250 (say \$1,200) in the case of the 25 hp. chassis (£1050 to £800) to £375—approximately \$1800—for the 30-98 hp. open four passenger. These drops have come on top of the Vauxhall reductions in October last, which were of only slightly smaller amounts.

Rover has knocked nearly \$200 off the price of the 8 hp. air-cooled light car (approximately \$1500 to \$1300); Arrol Johnston and Vulcan have reduced their five passenger car prices \$120 and \$370 respectively—these are 15 hp. and 20 hp. cars, the A. J. now selling at \$3500 and the Vulcan \$3370.

Vauxhall and Rover were two of the firms to adopt the price refund guarantee scheme. Rover is continuing it on the lower figure, but Vauxhall has decided to give no guarantee from now on. Both apparently felt quite safe a couple of months back in offering to refund to purchasers meanwhile the amount of any reduction made before June 30th next; but circumstances have been too strong for them, and they have been faced with the choice of two evils—either refunding to purchasers who have bought under the guarantee or losing the sale of many new cars during the rest of 1921.

Obviously the reimbursing of part of the cash already received is not going to ease the financial stringency which so many firms in all industries are still experiencing.

## Belgian Shop Seizure Meets Quick Action

PARIS, March 18—(*Special Correspondence*)—Refusing to work with an ex-soldier who was not a member of their labor union, the workmen at the Metallurgique automobile factory at Marchienne-le-Pont, Belgium, took possession of these works and turned out the entire technical staff, the office employees, and the caretaker.

The occupation was short lived, for threatened with a new law which punished by prison any attempt to interfere with the liberty of labor, the men undertook to negotiate. The result was a complete climb down on the part of the workers, who recognized their mistake in refusing to work with a non-union man and the illegality of the seizure of the shops. In consequence the men abandoned the shops without any guarantee as to the future policy of the directors and work was resumed twenty-four hours later.

## FIJIANS QUIT EATING TO TAKE UP SPEEDING

AKRON, March 26—Shades of the Polynesian aborigines!

The heathen Fiji Islander has given up his time honored sport of eating missionaries, and has gone in for automobiling.

Figures obtained by one large Akron tire company show that about 150 automobiles now are operating in the Fiji Islands, whose inhabitants for decades have been classed with the "wild man of Borneo" and the bushman of Tasmania.

The Fiji Islanders show a preference for American cars and American tires. A Goodyear dealer who had courage enough to penetrate the Fiji Island jungles, and to establish an office at Suva, the capital city of the Islands, has just been rewarded by orders from the native islanders for 500 tires and 1000 tubes.

## Business Methods Hurt American Goods in India

NEW YORK, March 28.—The practice of changing agencies without sufficient provocation has been detrimental to the good-will of American automotive companies doing business in India, is the opinion of Innes Randolph, who is in charge of Far Eastern affairs for the General Motors Acceptance Corp. The Indian dealer in American automobiles feels, Randolph says, that he simply is being used and that as soon as the manufacturer can make a more advantageous connection he will be thrown aside. He cites an instance of one company which took an agency away from a man who handled its car for 10 years and gave it to another man who agreed to take a larger quota of vehicles.

Randolph's investigation has convinced him that India does business with the United States not because it likes Americans but because it likes our products. As soon as some other nation comes into the field with equally good products at a similar price, America will lose its business in India. Indians do not like American business methods.

## ALUMINUM TARIFF OPPOSED

WASHINGTON, March 28—When the work of framing tariff legislation begins at the extra session of Congress, a spirited fight will be made by automobile manufacturers and other industries against the proposal to increase the tariff on aluminum. The entire supply in this country is controlled by the Aluminum Co. of America which has made enormous profits in the last seven years. Manufacturers feel that if aluminum is not placed on the free list the present tariff of 2 cents a pound should be left undisturbed instead of being raised to 7 cents as the company is urging.

## Dealers in China Form Association

Will Boost Industry Through Organization—To Hold Show and Foster Roads

SHANGHAI, CHINA, Feb. 18—(By Mail)—A dealers' association, embracing all of the motor interests of the Central China territory, has been organized in this city and will begin operations within a short time. The association is now in a tentative form but will be placed on a firm basis by spring. Among the proposals which are to be taken up is that of an annual motor show.

A separate company is being formed to finance the show and stock is being taken by all of the principal distributors of Shanghai. A representative is being sent to the United States to interview the manufacturers represented in this field and to obtain their assistance in the way of exhibits and advice. The show will probably be held in October and will be the first of its kind in the Orient, with the exception of small exhibits in India and the Straits Settlements.

The good roads movement will also be fostered by the new association, and it is probable that its formation will lead to similar organizations in the North and South China territories, and the linking of the three into an organization that will embrace all of the motor interests in the nation.

## Wolseley Production on 175 Weekly Basis

LONDON, March 11—(*Special Correspondence*)—The Wolseley Co. of Birmingham is now producing at the rate of 175 cars weekly on a 47 hour week, with 7000 to 8000 men employed, according to a statement given out at the Adderley Park works of the company this week. The company expects to reach a 250 weekly output when it will institute the conveyor system of assembling the chassis.

The molders' strike imposed a loss of about \$5,000,000 in production, the company declared, to the corresponding advantage of importers of cars. The management made it clear that it was not out for mass production and that there is no margin for reducing prices.

## TRACTOR MARKET IN INDIA

OTTAWA, ONT., March 26—H. R. Poussette, director, Commercial Intelligence Service, says that a market exists in India for farm tractors. According to his report to the Trade and Commerce Dept., Ottawa, the Director of Agriculture of the Madras Presidency is also very sanguine as to the future of tractor plowing. Demonstrations are necessary to convince the agricultural population of the very great advantages to be secured from this method while the extra profits are the strong dealer point.



## Imports to Dwindle Under New Tariffs

### Application of American Valuations to Foreign Cars Expected to Reduce Market

WASHINGTON, March 28—Imports of automotive products which have increased of late are expected to dwindle when Congress enacts amendments to the Customs Administrative Act, effecting the transfer of the basis for the estimation of ad valorem duties from foreign to American wholesale market value. This change would automatically increase the price of foreign cars on American markets.

Judge Marion De Vries, of the United States Court of Custom Appeals, has been consulted by the House Committee on Ways and Means as to the proposed amendment. He has recommended the adoption of the language of the existing law in every possible detail, adding only where absolutely necessary, changed words to effect the new purpose, and thus avoid any possible uncertainty as to the new phrases.

Upon the insertion of the words United States alone, the basis of valuation is made the American valuation unqualifiedly and without any deduction. He further suggests that the actual duties levied upon the imported goods should be deducted after the American market value is properly determined. Otherwise, importers would be paying duties on duties so that it would approach an embargo.

The American valuations would be calculated on the wholesale market value of such merchandise in the principal markets of this country. The value at the port of importation or entry is not the dutiable value. The importer would be required to pay duty on the American valuation taken at the time of exportation to the United States. In the case of automobiles the customs officials would have to take into consideration the prices on markets throughout the country, noting the differences in quality, make and value. The details as to application will be determined by the Committees shortly.

### Truck Manufacturers Look for Better Sales

NEW YORK, March 28.—Twenty-four truck manufacturers whose production has just been checked up are making an average of 33⅓ per cent of their normal output, as compared with 16% during the period when production was at its lowest ebb. The latter period in some cases dated back as far as August, and in others began in December, but the average low month for these manufacturers was December.

Most of these manufacturers expect the next step upward in production to be made in April, and while a good many state frankly that they don't know how

greatly production will be increased, several expect to reach 50 per cent of normal and a few 75 per cent. The average forecast of these manufacturers for the latter part of 1921 is a production of between 50 per cent and 75 per cent of monthly averages early last year. All of these manufacturers report encouraging indications from the retail field of a decided improvement within 60 days.

### Car Production Brings Increased Tire Business

AKRON, March 29—The Goodyear Tire & Rubber Co. announced to-day plans to materially increase production early in April with the re-employment of at least 1200 men. The opening up of automobile factories and the general increase in orders from all parts of the country have stimulated both original equipment business and sales direct to consumers, necessitating larger production.

Under present plans, Goodyear will go to basis of 16,000 casings and 16,000 tubes daily, as compared to present production of 12,000 casings and 13,000 tubes. They will continue the five day week for the time being, but hope soon to go to five and one-half days, with possibly two eight-hour shifts.

The increase in production, amounting to about 33 per cent, is brought about by a 70 per cent increase in April orders over March orders for original tire equipment of automobile manufacturers. Notices are being sent to former employees to return to work early in April. The company will rehire only former employees.

The meeting of Goodyear stockholders called for to-morrow to act on the reorganization plan has been postponed until April 6.

### WESTCOTT ON FULL TIME

SPRINGFIELD, OHIO, March 28—“April promises to be the best month since last July,” said General Manager H. G. Root of the Westcott Motor Car Co. “Dealers in some parts of the United States report a steady demand for cars. This is especially true in Chicago. The East is also showing a revival in business and the outlook is encouraging. In the Far West it is not so good.” All departments of the Westcott plant went on full time to-day. Some of the departments so far have been running about four days a week. While all departments started full time, only about 75 per cent of the normal force is at work.

### LUCIEN PERISSÉ DIES

PARIS, March 10—(Special Correspondence)—Lucien Perissé, vice-president of the Technical Commission of the Automobile Club of France, died here to-day at the age of 53. Perissé was a leading figure in French automobile technical circles, and in addition to his work at the technical commission was secretary of the Syndicate of Automobile Transportation.

## French Exports Gain 854 Per Cent in Year

### Great Britain, Spain and Belgium Best Customers—American Gain 600 Per Cent

PARIS, March 18 (Special Correspondence)—French automobile exports for the year 1920 show an increase of 854 per cent compared with the preceding year, the total figures being 124,509,000 francs for 1919 and 1,187,972,000 for 1920. The greatest volume of business has been done with England for a total of 265,599,000 francs, Spain coming second with nearly 219 million francs' worth of automobiles, and Belgium a very close third. French automobile exports to the United States have jumped from 2,187,000 francs in 1919 to 15,705,000 in 1920.

French automobile imports have decreased 45 per cent during the year, dropping from 383 million francs in 1919 to 211 millions last year. The following table gives the details of French exports to the leading countries, the values being in francs:

#### FRENCH AUTOMOBILE EXPORTS IN 1920

	Frs.
Great Britain .....	265,599,000
Germany .....	10,361,000
Belgium .....	217,361,000
Switzerland .....	36,533,000
United States .....	15,705,000
Argentina .....	17,313,000
Italy .....	22,649,000
Spain .....	218,949,000
Brazil .....	10,955,000
Other Countries .....	138,475,000
French Colonies .....	234,072,000
Total .....	1,187,972,000

### City Business Best in Missouri District

KANSAS CITY, March 28—Motor car dealers in small country towns and larger cities inland from distributing centers, can get inspiration from a condition in merchandising other commodities, revealed this spring.

It is said that volume of business of country merchants, especially those in cities of the interior, has increased more rapidly in February and March, than the business of merchants in the “distributing centers.”

So far, to the end of March, the reverse has been the case in the motor car business. The Kansas City dealers, it is reported, have had better retail trade than have the dealers of interior towns. The natural query is whether the country dealers have been asleep and have missed an opportunity that dry goods and clothing merchants have grasped?

Analysis of developments in general merchandise lines tends to show that the public in smaller cities and rural communities have patronized more largely than last year the stores which have built up local prestige and have apparently spent almost as much money as a year ago.

# Rumanians Bring Cars to U. S. Free

## Branch Bank Here Gets Army Trucks

**Buys American Made Vehicles  
from British in France—  
Come in Duty Free**

(By Cable to AUTOMOTIVE INDUSTRIES)

PARIS, March 28.—The British army's automobile park at Abbeville, comprising 1000 trucks and passenger cars, has been purchased by the Banca Marmorosch Blank & Co. A majority of the vehicles are of British make, but in the lot are 350 trucks of American manufacture, including Peerless, F. W. D., Locomobile, Pierce-Arrow, Packard and Riker as well as a considerable number of Studebaker and Cadillac passenger cars.

The bank will ship most of the American vehicles to the United States for sale there. The first lot already has left. The sale will be handled through the New York branch of the bank.

### Banker "Not Interested"

NEW YORK, March 29.—The Banca Marmorosch Blank & Co. occupies ornate quarters on the first and second floor of the new building at 31-33 Broadway. The bank, controlled by Rumanians and representing the Rumanian government in financial transactions, has obtained permission from the New York State banking commissioner to do business in this State. Its headquarters are in Paris, but it has important branches at Constantinople, Saloniki, Avlona, and many of the important towns in the Balkan states.

The manager of the New York branch is Dr. Zeltner. When asked to-day by AUTOMOTIVE INDUSTRIES for a statement regarding his plans for disposing of the American made motor vehicles which are being brought into this country duty free, he had much difficulty comprehending the purpose of the information, and stood pat on the statement that he was "not interested."

It was claimed, however, that the first lot consists entirely of trucks and that they will be sold through the United States Truck Sales Corp.

### N. A. D. A. Roused to Action

ST. LOUIS, March 29.—Resolutions adopted by the directors of the National Automobile Dealers Association protesting against the reimportation of American made motor vehicles duty free, from France and England to be sold at low prices in competition with American dealers, have been forwarded to all the State associations of the N. A. D. A. to

## M. A. M. A. FINDS TRADE STEADILY IMPROVING

NEW YORK, MARCH 31—Optimism with a capital O has been radiated at the last group meetings of the Credit Department of the Motor and Accessory Manufacturers Association. These are some of the rock bottom facts brought out by the reports of members:

Business in March has been better than January and February combined. Orders already received make it certain that April will exceed March and that May will be at least equal to this month.

Collections are quite a bit better than they have been. Motor vehicle manufacturers who have given notes are whittling them down with greater rapidity.

There has been a substantial number of releases on old orders and some new orders.

A considerable number of passenger car manufacturers are operating at 50 per cent of capacity or better.

Several parts manufacturers now are operating at above 50 per cent of capacity, but the majority of plants are running about 25 per cent.

All the parts manufacturers are agreed that motor car prices must come down before there can be any more stimulation of business.

Nearly all parts manufacturers have reduced wages but are getting greater efficiency. A few have cut the salaries of office employees.

It was reported that factories operating at more than 75 per cent of their capacity include Franklin, Cadillac, Reo, Nash, Studebaker, Ford, Autocar, Velie and International. Oldsmobile and Grant are rapidly getting into this class.

be discussed and acted upon by them. When the State associations have gone on record on the subject, United States Senators and representatives will be informed of the position taken.

Attention of the Iowa Automobile Dealers Association has been called by Mook to a recent statement by Representative James W. Good of Cedar Rapids, chairman of the House Appropriations Committee, in which he declared practically all the passenger carrying automobiles in the United States are luxuries and should be taxed accordingly. Good asserts that a horsepower tax should be imposed on automobiles to bring in revenue of \$200,000,000 a year.

## Plan Special Clause on Rebuilt Trucks

**Congressional Leaders Recognize  
Importance of Protecting Home  
Market from Flooding**

WASHINGTON, March 30—It seems quite likely that the House Committee on Ways and Means will insert a clause in the proposed anti-dumping law which will effectively block English and French exporters from selling rebuilt trucks and cars of American manufacture on local markets at prices below production costs. Senator Penrose, chairman of the Senate Finance Committee, advised AUTOMOTIVE INDUSTRIES to-day that ample protection would be given domestic producers from all forms of foreign competition in this bill which must originate in the House.

The Congressional Draft Bureau, a new organization created to assist the various committees in preparation of legislative measures, has not taken up the anti-dumping bill yet. The committees will frame the bill when it has disposed of the emergency tariff and American valuations amendments. It is believed that representatives of automotive organizations will appear before the Senate and House committees before the bill is written in order to have their recommendations incorporated in the draft as it will be reported out to the Senate and House early in the session.

John E. Walker, chief of the Senate Draft Bureau, in an interview with AUTOMOTIVE INDUSTRIES declared that the question of reimportation had not been considered because of the pressure of other work. The agitation in behalf of this measure has found many willing advocates in the Senate and House. The fact that the Army sold this surplus equipment abroad at low prices in order to prevent an economic depression by dumping in this country is recognized as an important reason why foreign dealers should not be permitted to take advantage of present customs laws and sell at prices below labor costs here.

### Will Ask Specific Proviso

There is some question as to the probability of proposed American valuations effecting the desired protection. It is argued, however, that customs officials would find it difficult to appraise these trucks on the new valuation basis which is reckoned from wholesale prices prevailing on principal American markets. Truck dealers insist that a proviso should be included in the anti-dumping bill which would cover this item specifically. The Treasury is expected to recommend certain paragraphs in the bill when the Ways and Means Committee asks for advice.



# Parts Service Plan Starts Storm

## Fight Threatened by Manufacturers

### Truck Assemblers Declare They Will Not Tolerate Units Station System

DETROIT, MICH., March 30—Bitter opposition to the direct parts servicing plan proposed by prominent unit parts manufacturers and under which they propose eventually to cover the entire country with a chain of service stations, was displayed by members of a committee representing the Motor Truck Manufacturers Association, at a meeting here yesterday. The conference was called to discuss the plan and make recommendations to the association.

At the close of an all-day session at which several representative truck manufacturers were heard, a resolution was adopted to be presented at a meeting of the membership of the association to which parts makers and others interested will be invited. This meeting will be held April 12 at the Detroit Athletic Club.

The text of the resolution will not be made public until after it is presented at this meeting, but it can be stated that it expresses strong and unalterable opposition to the plan as being detrimental to the interests of the truck manufacturer, dealer and distributor as well as to the parts manufacturer.

The resolution was adopted by unanimous vote of the committee which was composed of B. A. Gramm, chairman; J. W. Stevenson of the Indiana Truck Corp.; M. Cook, general manager of the Service Motor Truck Co., and Otto Armleder, president of the O. Armleder Co.

### Not the Function of Parts Maker

Recognizing the fundamental right of the owner to demand parts standardization, prompt service and reasonable costs, and admitting the present condition of the truck industry is due to woe-lack in that regard, members of the committee and other executives insisted it was not the function of the parts maker to attempt to remedy the existing evils but a duty up to the manufacturer.

Declaring their views represented the opinion of 90 per cent of the truck assemblers, members of the committee described the parts station plan as a "selfish and arrogant attempt" of the parts manufacturers to take advantage of conditions. They declared the plan, if permitted to operate, would strike at the very heart of their business in that it would put a premium on the curbstone dealer and the mushroom manufacturer and drive the legitimate manufacturer with heavy investment into bankruptcy.

The man who wanted a truck under such conditions, it was asserted, would simply go to the parts depot, secure the necessary units, purchase blueprints and build his own truck.

"That is our greatest objection," said one member of the committee. "The fact that 20 per cent of our profit comes from the parts and service end, which necessarily would be eliminated, is but a minor consideration."

### Must Give Owners Service

Back of all the discussion, however, stalked the ghost of the owner demanding prompt, efficient and reasonable service coupled with the fact that more than 30 major parts depots now are functioning successfully. Committee members, while very willing to speak freely with regard to the action to be taken to check the progress of the plan, would not speak as official representatives of their organization. They declared it would be their plan to go to the parts manufacturers participating and demand that they renounce affiliation with the group participating, and in the event of refusal, simply to cancel contracts and cease to do business with that manufacturer.

It was even suggested unofficially that truck manufacturers go to the parts makers in a body and make the demand, holding out the threat of establishment of co-operative parts manufacturing concerns or diversion of their business to independent concerns now existing. No action was taken, however, on this proposal.

Parts makers interviewed after the meeting did not appear perturbed by the veiled threat. They take the position that the owner is the man who must be satisfied, and they declare that the owner is going to demand the standard parts now being marked in his car or truck. They assert that when a man contemplates a purchase, no matter how little he may know about the automobile or truck, the first thing he is going to ask is regarding the make of engine, axle clutch, transmission, etc., and that he is not going to buy the car or truck that is not built of standard and well known units.

### Read Letters from Makers

Practically the entire day was spent in reading letters from truck manufacturers and assemblers. Committee members said the tenor of a great majority of the letters was the same—violent and unalterable opposition. The morning session was confined to committee members and truck executives, including M. L. Pulcher, vice-president of the Federal Motor Truck Co.; J. F. Bowman, sales manager of the Garford Motor Truck Co., and R. M. Reid, secretary of the Master Truck Corp.

Telephone messages were sent to parts  
(Continued on page 735)

## Earl Chosen Head of Briscoe Motors

### Former Willys-Overland Executive Succeeds H. F. Wardwell —To Push Production

JACKSON, MICH., March 30—Clarence A. Earl, former executive vice-president of the Willys-Overland Co., has been elected president and general manager of Briscoe Motors Corp. He will succeed H. F. Wardwell, who retires from the presidency to become a vice-president and member of the board of directors.

K. R. Jacoby, formerly vice-president in charge of purchases at the Willys-Overland, will also go to the Briscoe.

There have been persistent rumors for several weeks of impending changes in the Briscoe company. The plant recently closed for inventory following announcement of a largely increased production schedule and this aggravated the reports regarding its affairs. This was followed by a report that W. C. Durant had made an offer for the property. President Wardwell admitted the Durant report was correct but declared there was no possibility of a sale.

Earl was called to Chicago Monday by the financial interests back of the company and announcement of his election to the presidency was made yesterday. As executive vice-president of the Willys-Overland Co. he became widely known and is regarded as particularly strong as a production man. Earl left the Willys organization several months ago after a disagreement with Walter P. Chrysler and was succeeded by C. B. Wilson.

Earl said to-day the Briscoe company now was assured of ample financing and that production would be maintained at a pace to meet the increasing demand.

## Fort Wayne Tire Files Petition in Bankruptcy

FORT WAYNE, IND., March 31—The Fort Wayne Tire & Rubber Co., which has had a very checkered career since its organization two years ago, has filed a petition in bankruptcy in the Federal court. According to the petition the concern's assets amount to \$427,976.42 and its liabilities total \$246,496. The assets consist principally of open accounts, tools and machinery and stock in trade.

The assets listed included ground and buildings valued at \$59,095; stock in trade, \$104,449.46; note receivable, \$6,071, and machinery and equipment \$172,881. Unsecured claims amount to \$210,236.22.

## Penrose Declares for Unit Hearings

### Opposition Is Declared to Separate Presentation of Taxation by Organizations

WASHINGTON, March 30—Assurances have been given business interests of the country that improper taxes will be abolished and income taxes reduced all along the line to the collection point which is almost equivalent to relief legislation, according to Senator Penrose, chairman of the Senate Committee on Finance. He believes that this definite statement should be sufficient to inspire the business world into renewed activity and confidence in the future.

As the various organizations in the industry have expressed a desire to speak independently on tax proposals it is of importance to note that the chairman of the Senate Committee and other Congressional leaders are opposed to proposals of this kind. In an interview with AUTOMOTIVE INDUSTRIES to-day, Senator Penrose stated that the committees would insist on short hearings when internal revenue revision is considered. "I regard the individuals and associations demanding special hearings as enemies of their own interests," he said, "for they often insist on presenting their views on frivolous grounds and generally we find wide-spread duplication."

The Senator makes clear the need for few witnesses in the fact that the testimony taken by the Senate Committee will be used by the House Committee on Ways and Means in the formulation of tax schedules. The fact that the Senate conducts the tax hearings first and the acceptance of this testimony by the House is a new departure which is accepted by both bodies in the interest of expediency. The House Committee will call only such witnesses as are necessary to clear up points in the testimony adduced before the Senate Committee. Treasury tax experts will be called into executive sessions of these committees before the schedules are submitted to the House and Senate.

#### Revisions to be Non-Partisan

The tax revision will be carried out in a non-partisan spirit, Senator Penrose says, and therefore it should encounter but little delay when the committee reports are placed before Congress. Senator Penrose believes that the collection point on income taxes must not be prohibitive. He contends that the wheels of industry will be stopped when the amount of tax robs the taxpayer, who is an investor, of all initiative and enterprise.

The chairman holds that the Government will ultimately gain in tax reductions where it restores sufficient incentive to the taxpayer to invest in industry and other forms of development. An effort will be made to determine the collection point on various commodities on

a plan similar to that used before the prohibition period, when the tax on whiskey was known almost to a mathematical point. Experts argued, and experience has proved, that the revenue decreased as the rates were increased.

Because of the expensive litigation which developed from the uncertainties as to the intent of Congress in framing fiscal legislation, Senator Penrose has announced the creation of a Congressional Draft Bureau which will determine the phraseology of all laws.

### Associations Oppose Single Hearing Plan

NEW YORK, March 29—Announcement by Senator Penrose that each industry should present its taxation views to the Senate Financial Committee through a single spokesman instead of having a presentation by each branch of the industry, runs counter to the plans of the various automotive organizations. All these associations with the exception of the Motor & Accessory Manufacturers Association have adopted virtually the same platform. It calls for strict governmental economy, funding of the war debt and a general retail sales tax. The M. A. M. A. is in accord with these plans except that it favors a turn-over tax.

It has been proposed that the various tax committees present their arguments individually instead of through a spokesman for the whole industry. The National Automobile Chamber of Commerce would speak for the passenger car and truck manufacturers; the Rubber Association of America for the tire makers; the M. A. M. A. for the parts manufacturers, and the N. A. D. A. for the dealers and garage men. It is the contention that each in itself is a big industry and that each is entitled to sufficient time to present its program.

Information gathered to-day indicated that the associations would not recede from their determination to have individual hearings at Washington notwithstanding the attitude of Senator Penrose, and there was a disposition to take the position that they were entitled to adequate time to present their arguments in the most forceful way. It is probable a conference will be held soon of representatives of the national associations to determine upon a plan of action.

#### To Push Tax Resolution

The tax committee of the N. A. C. C. will submit to the Chamber of Commerce of the United States at its annual meeting at Atlantic City beginning April 27, a formal resolution in conformity with its own tax program which has already been submitted to Congress. The resolution will call upon Congress to reduce Governmental expenditures to a sane, normal standard at once; fund the cost of the war and repeal all special taxes growing out of the war including excess profits, surtaxes, transportation and excise taxes. The resolution will assert that if further revenue is necessary after the adoption of a "moderate, scientific

(Continued on page 736)

## February Exports Drop to 40 Per Cent

### Passenger Cars Show Greatest Loss Compared with 1920 Shipments—Engines High

WASHINGTON, March 28—Automotive exports from the United States during February of this year were approximately 40 per cent in comparison with exports the same month a year ago. Including trucks, motorcycles, passenger cars, parts and engines, the exports for February this year totaled \$10,400,168 in comparison with \$26,186,399 for the same month of 1920.

These figures, announced to-day by the Bureau of Foreign and Domestic Commerce, are preliminary totals and do not show the detailed exports to the various countries. Consequently, it is not possible to determine what territories are chiefly responsible for the decline.

The export trade in all products from the United States showed a decided falling off for this month and the course of automotive trading apparently was in sympathy with that of the broader markets. However, February is the shortest month of the year and this naturally would bring about a lower total than in the preceding month of January. Furthermore, shipments would not be made in February to countries south of the equator, as they would arrive at their destination too late for the normal sales season, which is the reverse of that in the northern countries.

As was to be expected, the shipments of passenger cars showed the largest decline, the comparative values of the two months being \$3,165,170 and \$11,604,622. The slumping off of motor truck sales was much less, being \$1,952,736 for February, 1921, and \$4,161,494 for February, 1920. The shipments in parts and equipment, not including tires, were slightly more than 50 per cent.

The totals for engine shipments, which include automobile, marine, stationary and tractor gas engines, were \$1,523,408 as against \$2,291,507 for February of 1921, the exports in this category showing the smallest decline of any of the lines. The shipments of stationary gas engines were, in fact, of a slightly higher value for the month of this year than they were for last year.

The sales of gas tractor engines were about 66 per cent in comparison with last year, dropping from \$1,247,431 to \$827,694. This is the item which covers farm tractors. According to unofficial estimates of the Bureau, about 90 per cent of all the shipments coming under this head are tractors.

#### DEALER GETS BARLEY VERDICT

DETROIT, March 28—C. C. Stubbs, a Kansas City dealer, was awarded a verdict of \$3,692.68 in the Federal Court for eastern Michigan against the Barley Motor Car Co. of Kalamazoo for cancellation of contract.



## INDUSTRIAL NOTES

**Hydraulic Steel Co.** has been assigned the Frayer and Howard patent by the Phelps Mfg. Co., Columbus, for a consideration of approximately \$50,000. The patent is for a wire wheel with spokes laced in the side ring grooves. The rims will be manufactured and marketed through the Cleveland Welding & Mfg. Co., a subsidiary.

**Hercules Steel Casting Co.**, Milwaukee, which operates one of the largest exclusively electric steel foundries in this district, is increasing its capital stock from \$300,000 to \$400,000. The new issue, consisting of 7 per cent preferred stock, will be used to purchase additional land and equipment and to increase the working capital.

**Lee Tire & Rubber Co.** reports net sales for the first two months of the current year as about \$1,500,000. This is about the same as sales for the corresponding period in 1920. The plant is now running at about 75 per cent of capacity.

**Jefferson Rubber Co.**, Jefferson, Wis., has made its first deliveries of tires, and by April 15 or May 1 production is expected to be on a regular quantity basis. Orders on the books will require maximum capacity to July 1.

**Connersville Foundry Corp.**, a subsidiary of the United States Automotive Corp., which makes the Lexington car, is completing extensive additions to its already large plant.

**Goodlin Automotive Equipment Co.**, South Bend, Ind., has been organized for wholesale distribution of automotive equipment. Operations will be started April 1.

**Storm King Mfg. Co.**, Hartford, Wis., probably will relocate its plant and office in Winneconne as the result of negotiations with the Commercial Club.

**Sidney B. Bowman Automobile Co.** has been appointed New York distributor for Briscoe. In addition to Briscoe, Bowman handles Grant and Kissel.

**Bonney Vise & Tool Works, Inc.**, has changed its name to the Bonney Forge & Tool Works.

**Parenti Motors Corp.**, Buffalo, is planning the location of a branch factory in Atlanta.

**Towmotor Co.**, Cleveland, has re-elected officers and directors.

## FINANCIAL NOTES

**Fisk Rubber Co.** in its report for 1920 shows surplus earnings, following inventory adjustments and Federal taxes, of \$2,130,133. After payment of preferred dividends, this was equal to \$1.68 a share on the \$15,494,000 common stock of \$25 par value. In 1919 the company reported earnings of \$3,994,657, equal to \$5.99 a share on the \$12,254,300 stock in that year. Net profits for the year were \$5,034,950. The profit and loss surplus Dec. 31 was \$7,789,085.

**Timken-Detroit Axle Co.** reports net profits for 1920 after reduction of inventories and Federal taxes of \$712,509 and a total surplus of \$17,820,062. Cash on hand was shown as \$671,151 and inventories \$10,932,521. The land, building and equipment account totaled \$8,357,801, of which notes to banks were \$3,000,000 and accounts payable \$387,480.

**Hupp Motor Car Corp.**, in a balance sheet as of Nov. 30, shows total assets of \$16,119,231, which includes cash of \$281,542 and in-

ventories of \$5,232,145. This is an increase in assets of \$1,351,424. The net assets applicable to common stock amounted to \$7,296,472, or \$14.05 a share of \$10 common stock.

**American Bosch Magneto Corp.**, in a balance sheet as of Dec. 31, shows total assets of \$9,896,083 for 1920 as compared with \$7,655,044 for 1919. The cash balance at the end of the year was \$332,596 as compared with \$88,379 in 1919. Inventory totalled \$4,344,727 as against \$2,928,582 the year previous.

**Gray & Davis** for the seven months ended July 31, 1920, reports net loss of \$463,109 and for the five months ended Dec. 31, 1920, a net loss of \$4,998. This does not include depreciation of about \$93,000 in the earlier period, which should have been charged.

**H. H. Franklin Mfg. Co.** reports net profits for the year ended Dec. 31 as \$2,225,625 and net addition to surplus for the year of \$696,515. Inventories Dec. 31 totalled \$7,614,696, compared with \$11,100,000 in September last.

**Times Square Automobile Supply Co.** for the year ended Dec. 31, 1920, shows net sales of \$5,456,953, which after deductions for cost of sales, Federal taxes, expenses, etc., leaves a net profit of \$9,952.

**Kelsey Wheel Co.** reports gross sales of \$25,200,913 for 1920 and net operating profits of \$3,325,804. Net profits for the year after all charges were \$1,916,008.

**Handley-Knight Co.** will float a \$200,000 bond issue, which will be taken up by present stockholders and will not be offered to the general public.

**Thomart Motor Co.** reports the sale of \$750,000 of the \$1,000,000 stock of the first issue, sold between August, 1920, and March, 1921.

**Moon Motor Car Co.** has declared a regular quarterly dividend of 1½ per cent on preferred stock outstanding, payable April 1.

**F. B. Stearns Co.** will pay the regular quarterly dividend of \$1 a share on April 11.

Parts Service Plan  
Arouses Truck Makers  
(Continued from page 733)

makers asking their attendance in the afternoon, but Fred Glover, general manager of the Timken-Detroit Axle Co., was the only one who responded. It was said G. W. Yeoman, general manager of Continental Motors, credited with evolving the parts servicing idea, was ill. Glover said after the meeting that his company was in a neutral position and would await the outcome of the meeting April 12 before making any statement regarding its position.

"If it is the best thing for the industry," he said, "then we will be in, but until there is something more of a unanimity of opinion we will remain neutral."

Glover voiced the sentiment of everyone present that the time has come when adequate service is demanded. Committee members, admitting the truth of the statement, declared it was a matter clearly within their province and expressed assurance that in future every truck manufacturer would see to it that every dealer and distributor gave the major portion of his attention and a big part of his investment to the parts and service end of his business, guaranteeing full protection to the ultimate consumer.

## METAL MARKETS

**W**HILE the larger part of steel shipments going forward to automotive consumers continues to be on account of previously suspended and lately reinstated orders, a fresh buying movement, modest in scope but nevertheless evidence of a genuine demand, is beginning to crystallize. Especially gratifying is the representative number of automotive interests that are renewing their interest in the steel market. Much misinformation has been spread abroad with reference to prices applying to shipments on account of reinstated suspensions. In some quarters it is sought to create the impression as though all such shipments were being billed at last year's obsolete contract prices. In fact, however, reinstatements have been as much a matter of individual negotiation with reference to the price at which they are to be billed, as have been fresh orders of late. In all representative shipments of such reinstated orders the price was one resulting from a mutually agreeable compromise between seller and buyer. Stocks of automobile sheets in consumers' warehouses, which have been admittedly large, are beginning to shrink, and sheet makers are trying to ward off encumbrance of their order books by sacrifice commitments when a turn for the better might be just around the corner. This, at least, is the producer's point of view. He is not so eager for more business at prevailing price levels as he is for more business at prices that will be expressive of the better demand. Clear understanding of this frame of mind, in which sheet producers and, for that matter, steel producers generally are at this time, should help the automotive purchasing agent in planning his buying campaign. In the pig iron market automotive foundries, in spite of the fact that most of the buying is in carload and 100-ton lots, continue to play first fiddle, because of the lack of demand from most of the other iron consuming industries. The non-ferrous metal markets show a somewhat steadier tone, but absorption by consumers is still light.

**Pig Iron**—Better demand for foundry and malleable from Middle West automotive foundries is noted. Cleveland melters are turning out more castings than they have in weeks. Two automotive interests are inquiring for from 500 to 1000 tons each. Furnaces are rather reserved when it comes to accepting contracts for future deliveries at current prices, which are nominally \$25 for both No. 2 foundry and malleable, valley basis.

**Steel**—Youngstown sheet mills will make no quotations except on individual specifications. This does not imply, however, that the market is higher than the previously quoted 4c. basis for No. 28 black. A small amount of business in No. 22 gage automobile body sheets is reported to have been done at 5.20c. Automotive demand for cold-rolled strip steel is steadily improving and sales at 5.85c. were reported.

**Aluminum**—The market remains dormant for the time being. There is, however, quite a little activity in Middle West aluminum foundries in the preparation of patterns, and a steady improvement in the demand for No. 12 alloy is looked for. Quotations are unaltered.

**Copper**—Chicago reports state that automotive buyers have resumed buying of radiator tubes and radiator brasses. The copper market shows a somewhat steadier undertone, sales of casting metal being reported at very close to the prevailing 12c. quotation in the "outside" electrolytic market.

**BANK CREDITS**

*Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America*

NEW YORK, March 31—Last week was marked by noticeably easier money, and a more active stock market, with rising prices and one "million-share" day. The bond market, on the other hand, was still irregular with no pronounced trend. Call money ranged from 6 to 7 per cent, with a ruling rate of 6½ per cent, while "outside" money was said to be available at from 5 to 5½ per cent. There was little business done in the time money market, and rates were unchanged from the week before.

The Federal Reserve note circulation of the Federal Reserve System as a whole declined \$32,151,000 last week, making a total reduction of \$474,200,000 from the December high. Federal Reserve bank notes declined \$3,760,000; and gold reserves increased \$5,226,000, and cash reserves \$7,188,000. Total bills on hand, however, increased \$62,005,000, and total gross deposits \$66,252,000. As a result of these changes and of the new method of computing the ratio, the ratio of total reserves to deposit and Federal Reserve note liabilities combined declined from 51 per cent to 50.8 per cent. The ratio of gold reserves to Federal Reserve notes in circulation, after setting aside 35 per cent against net deposits, on the other hand increased slightly, from 60.6 per cent to 60.7 per cent.

For the two weeks ending March 12, there was a 61½ per cent increase in building plans filed in New York City, an increase which reflected the stimulus of the tax-exemption subsidy granted on new structures for residential purposes. Reports from the various sections of the country indicate a general increase of activity in the building industry. From some points reported estimates of costs range from 15 to 25 per cent lower than those of a year ago.

### Associations Oppose Single Hearing Plan

*(Continued from page 734)*

ally regulated protective tariff" it should be secured "through a consumption tax on all commodities based on retail sales to the consumer." This presentation will be made by C. C. Hanch, chairman of the tax committee.

Another resolution which will be submitted at the Atlantic City meeting will deal with discriminatory duties in relation to the tariff. It will declare that a request should be addressed to the "legislative bodies of the United States urging provision in the general tariff for application of additional duties on products imported from countries that directly or indirectly discriminate against the trade of the United States in favor of that of other nations."

This subject will be taken up by J. Walter Drake, chairman of the foreign trade committee of the N. A. C. C. He

will outline the discriminatory duties imposed on American made automobiles by Canada, Australia and other portions of the British Empire. It will be contended that the tendency to extend the British preferential policy to the disadvantage of American commerce justifies a provision for additional duty on products from countries which discriminate against American trade.

### Advance-Rumely Shows Surplus of \$1,277,231

LA PORTE, IND., March 28—The annual report of the Advance-Rumely Co. for the year ended Dec. 31 shows a surplus after charges, Federal taxes, inventory adjustments, etc., of \$1,277,231, equivalent after deduction of preferred dividend to \$3.84 a share earned on the \$13,750,000 common stock. This compares with a surplus of \$2,401,907, or \$12.02 a share in the previous year.

Finley P. Mount, president, in his report showed that mark down of inventories which are carried at cost or market value, whichever is lower, necessitated a deduction of \$837,936 from 1920 earnings. A loss of \$279,336 was also taken on account of Government bonds, which were entirely disposed of. With another crop nearly due, President Mount said the outlook was good.

### Receivers Are Named for Liberty Starter

NEW YORK, March 26—Receivers have been appointed for the Liberty Starter Corp., manufacturers of starters for automobiles and airplanes with a plant at Poughkeepsie and a sales office in this city. The liabilities are listed at \$62,748 and the assets are said to be in excess of this amount. The company controls the Delano starter.

The company was organized Oct. 4, 1918, and has an outstanding capital stock of approximately \$1,000,000 common and \$1,000,000 preferred. The petition for receiver alleges that the corporation received about \$700,000 for the stock sold and has still due it \$92,000 on subscriptions. The patent rights to the starter which the company manufactured are listed as valued at \$1,000,000.

Fred S. Taggart as trustee for Howard S. Borden, principal creditor of the company, instituted the proceedings. James J. Lyons and John Inwood were named receivers.

### COURT RULES ON PATENT

CHICAGO, March 28—Judge Carpenter in the Federal District court has handed down a decision holding that the Grosvenor patent, No. 1,186,477 is valid and has been infringed by the Rockford Bookcase Co. The patent covers a varnish drying process and it is owned by the Wenborne-Karpen Dryer Co. of this city. The owners state that the only manufacturers of drying equipment now licensed under the patent are Drying Systems, Inc., Chicago, and the A. S. Nichols Co., New York.

**THE MOTOR STOCKS**

By JACQUES S. COHEN,  
of J. S. Bache & Co.

NEW YORK, March 31—Some time ago, at the request of AUTOMOTIVE INDUSTRIES, we prepared a statement on the automobile industry from the banking point of view and at that time we saw constructive elements at work toward the cleaning up of unsold stocks of automobiles throughout the country. At that time we also stated that we believed there would be a consistent improvement from that point, but that, as the year advanced, there would be a tendency toward concentration of the business in the hands of a few large, efficient and well-financed companies, while the smaller companies would be obliged either to consolidate for their own protection or go out of business altogether.

We see no reason to change this opinion at the present time. As stated above, we have seen distinct improvement in the automobile situation as a whole. Production schedules have consistently increased to a point where some of the larger companies are now operating anywhere from 50 per cent to 65 per cent capacity. From what we can learn sales have also been picking up and the momentum thus developed can very well carry an optimistic feeling through the first six months of this year. Thereafter, we should not be surprised to see a considerable falling off in the demand for passenger cars.

While it is accepted that the first six months of any automobile year usually produce 65 per cent of the total year's business, we cannot see how enthusiasm can be kept up beyond July 1. The purchasing power of the farmer and the planter has been reduced to a minimum by reason of extremely low prices for cotton and grain. The general purchasing power of the country, because of a substantial reduction in wages in all industries, has been considerably impaired.

So far as automobile security prices are concerned, the recent improvement in motor stocks seems to be discounting the favorable atmosphere during the first six months. However, we believe that as we near the end of this period, prudence would demand extreme caution regarding further commitments, pending the readjustment of the country's purchasing power to a basis somewhat nearer normal.

### ASK FOR TIRE RECEIVERS

HOUSTON, TEXAS, March 30—Stockholders of the Universal Tire & Rubber Association, capitalized at \$500,000, with a plant in this city, have filed application for the appointment of a receiver. An injunction has been granted restraining several persons named as defendants from disposing of bonds held by them as collateral. It is alleged that a receivership is necessary to conserve the assets of the company. The plant has been leased for one year to the Standard Rubber Co. at a rental of \$21,000.



## Men of the Industry

**E. A. Taylor** has assumed his duties as works manager in charge of production for the Liberty Motor Car Co. To take up this work he resigned as production engineer for the Pierce-Arrow Motor Car Co., where he was responsible for all standard and special tools, plant layout, arrangement of machine shop and assembly departments, and for the installation of progressive assembly. His duties at Buffalo consisted of criticism of design from a manufacturing point of view and the determination of all mechanical processes. Before going with the Pierce-Arrow Co., Taylor held executive positions with the Cadillac Co. for three years and in 1912 took charge of the Detroit plants of the Maxwell Motor Co. A year later he was transferred to the Maxwell plant at Dayton, where he was in charge of the entire factory, and in 1917 he became general superintendent of the Chalmers plant. He remained there two years.

**George H. Hannum**, general manager of the Saginaw Products Co., has been placed in charge of the Michigan Crankshaft Co., a subsidiary of General Motors Corp. The Crankshaft company operates plants in Saginaw and Lansing for the manufacture of crankshafts for General Motors cars. By this action the corporation consolidates all its Saginaw plants under one management except the National Plate Glass Co. plant, which is controlled by Fisher Body Corp., also a General Motors subsidiary. J. W. Wilford, who has been general manager of the Crankshaft company with headquarters in Lansing, is to become general manager of the Central Axle Gear & Products Co. when Hannum assumes his duties as supervisor in both crankshaft plants. The local crankshaft plant will continue under the active direction of T. M. Carpenter, local manager.

**B. F. Page**, formerly manager of the truck department of the Maxwell Motor Sales Corp., has been appointed supervisor in charge of the Omaha district for Maxwell-Chalmers, and S. W. Munroe, who was for several years in charge of the New England district for the Maxwell Motor Co., Inc., is appointed supervisor of the Boston district for Maxwell-Chalmers.

**W. C. Petersen** has been placed in charge of the metallurgical department of the Atlas Crucible Steel Co.'s mills at Dunkirk, N. Y. He was formerly associated with the Packard Motor Car Co. doing similar work. His work at Atlas will include research and standardization of the new chrome-molybdenum products.

**G. W. Machtreib**, formerly of the B. F. Goodrich Co., has been made general sales manager of the Detroit Trailer Co., taken over recently by the Mansfield Steel Co. Machtreib was connected with the Goodrich company several years, and is well known to passenger car and truck manufacturers.

**Charles H. Keel**, patent counsel for Curtiss Aeroplane & Motor Corp., and formerly in charge of the Washington office of General Electric Co., has opened a law office in New York.

**John F. Creamer** is now associated with Thomas J. Wetzel, New York, as manufacturers' agent. Creamer was formerly with the Firestone Steel Products Co., Akron.

**Leroy Kramer**, formerly vice-president in charge of production at Willys-Overland Co., has taken a position as vice-president of the Pierce-Arrow Motor Car Co.

**Carl H. Becker** has been appointed assistant sales manager of the Saxon Motor Car Corp., and Charles P. Ackerson has been appointed supervisor of dealers.

**D. P. O'Keefe** has been appointed general purchasing agent of the Chevrolet Motor Co. He has been assistant purchasing agent of Buick for the past ten years.

**F. E. Badger**, formerly general manager of the Canton plant of the Standard Parts Co., has joined the Detroit Steel Products Co.

### R. E. Carpenter to Head Hartford Parts Company

**HARTFORD, CONN., March 28.**—R. E. Carpenter of Boston, has been elected president of the Hartford Automotive Parts Co. to succeed Jarvis McA. Johnson who has resigned because of ill health. James M. Carney also has retired as general manager and chairman of the board of directors. He is an expert in efficiency engineering and it is understood he will return to this work. Carpenter has taken active charge of the plant. He will be assisted by L. J. Harley, Jr., of Springfield, Mass., who has been elected vice president, and by H. W. Bigelow, re-elected secretary and treasurer.

For ten years Carpenter was connected with the Taft-Peirce Mfg. Co. of Woonsocket, in charge of the research and development laboratories. Early last year he went with Hollister, White & Co. of Boston with whom he will retain his connection. He is optimistic over the future of the Automotive Parts Company and predicts an entirely satisfactory business this year. It is understood he was selected for his present position by Boston bankers who have been financing the company.

### Houston Buys Up Cars; Truck Business Slow

**HOUSTON, TEX., March 29.**—The automobile industry has revived unexpectedly fast in Houston, which is in the best position of any city in Texas as it is the center of the oil industry. Ford dealers here are sold out and Cadillac has more prospects than at any time in two years while Buick and Nash report a heavy sales increase in the last three weeks. Several medium priced lines are moving more slowly. A few lines are heavily stocked but there has been a general improvement in all makes.

The rural districts are not buying as rice and cotton farmers will be out of the market for some months. Houston is filled with used cars and sales of these are slow. Most cars are selling for one-third cash and the balance in 10 or 12 months.

Truck sales are very slow and several dealers are heavily stocked. Probably 50 per cent of the present truck dealers will give up their agencies when the

stocks they now have are sold. Several are reducing prices.

There have been no tractor sales in the rice area south of Houston, but vegetable crops between this city and Brownsville are being marketed and are helping car sales. The repair business has been slow but is improving.

### Receivers Are Named for Empire Rubber

**TRENTON, N. J., March 30.**—On complaint of the Big Bend Mining Co. which has a claim of \$12,710, Arthur H. Wood and C. Edward Murray, Jr., of this city have been appointed receivers for the Empire Tire & Rubber Co. The complaint filed by the coal company charged that while the rubber company was solvent, its obligations amounted to more than it had the ready cash to pay. It was asserted that unless receivers were named litigation would result which would dissipate the assets.

The complaint requested the court to enjoin all persons from levying attachments against the rubber company. The papers in the case stated that the plant is appraised at more than \$2,000,000 and that with merchandise and other assets amounting to about \$3,500,000 it would eventually be put on a paying basis. The liabilities, excluding capital stock, were given as \$1,500,000.

The decree of Judge Bodine in naming the receivers stated that the company was judged solvent but had no funds to meet its obligations. The receivers, who were required to furnish a joint bond of \$100,000, were authorized to borrow not more than \$50,000.

### Sterling Ends Sales Contract

**RUTHERFORD, N. J., March 30.**—The Sterling Tire Corp. announces the termination of its arrangement whereby Sterling tires and tubes, during the past year, have been sold exclusively through the Rubber Corp. of America, which also was the selling agent for products of the Empire Tire & Rubber Corp.

There has never been any connection between Sterling and Empire except that both employed the same selling agent.

The Sterling Tire Corp. has never been financially interested in Empire, and no one connected with Empire has been interested in Sterling.

### HARES ADVANCES PRICES

**NEW YORK, March 28.**—Production is steadily increasing in the plants of Hare's Motors, but particularly in the Mercer factory which is now somewhat behind its orders. The engineering department of the corporation is continuing its experimental work on a car which will be in a lower price class than either Locomobile or Mercer. Hare's Motors has found it necessary to revise its prices. The Locomobile is selling now at \$8600 as compared with the old price of \$8900 and \$7750 when the first big slash was made. The Mercer, which was reduced from \$4950 to \$3950 now is selling at \$4500. Production at a profit was found impossible at the lower prices.

# Calendar

## SHOWS

April 3-9—Denver, Annual Automobile Show, Auditorium.  
April 4-9—Seattle, Annual Automobile Show, Seattle Motor Car Dealers' Ass'n, Arena Hippodrome.

## FOREIGN SHOWS

April, 1921—Sofia, Bulgaria, Tractor Trials, under the Bulgarian Ministry of Agriculture.  
Apr. 20 - May 5—Mexico City, Mexican Automobile Show, National Theatre Bldg.  
May 28, 1921—Czecho-Slovak International Automobile

Exposition of Cars, Trucks, Tractors, Motorcycles and Equipment. Prague.

May 28-June 8—International Automobile Exhibition, Basle, Switzerland.

June, 1921—Reykjavik, Iceland, Agricultural Exhibition—Agricultural Machinery—Icelandic Agricultural Society, Reykjavik, Iceland.

Oct. 5-16—Paris, France, Paris Motor Show, Grand Palais, Administration de l'Exposition Internationale de l'Automobile, 51, Rue Pergolèse, Paris.

Nov. 4-12—London, British Motor Show, Society Motor Mfrs. and Traders.

## CONVENTIONS

May 4-7—Cleveland, National Foreign Trade Council.

May 17-19—Buffalo, Convention of Factory Service Managers, Auspices of Service Committee, N. A. C. C.

May 24-28—West Baden, Ind., Summer Meeting Society of Automotive Engineers, West Baden Springs Hotel.

Oct. 12-14, 1921—Chicago Twenty-eighth Annual Convention National Implement & Vehicle Ass'n.

## RACES

June 18—Uniontown, Pa., Speedway Events.

July 25—Grand Prix, Le Mans. Labor Day—Uniontown, Pa., Autumn Classic.

## S. A. E. MEETINGS

Buffalo section—April 19—Paper on "Carburetor Performance," by F. C. Mock.

Dayton section—May 3.

Metropolitan section—April 14—Paper on "Low Grade Fuel Carburetion," by A. H. Beach.

Minneapolis section—April 6—Discussion of repair equipment.

Washington section—April 1—Aeronautical Engineering Session.

## General Motors Export Names New Officers

NEW YORK, March 31—At a meeting of the directors of the General Motors Export Co., Paul Fitzpatrick, who recently resigned as a vice-president of the General Motors Acceptance Corp., was elected a director and vice-president.

The board of directors is now constituted as follows: J. Amory Haskell, Curtis C. Cooper, Paul Fitzpatrick, Alfred P. Sloan, Jr., Peter S. Steenstrup and Alfred H. Swayne.

The officers are as follows: J. Amory Haskell, president; Peter S. Steenstrup, vice-president and general manager of sales and service; Paul Fitzpatrick, vice-president and general manager of operations; Alfred H. Swayne, vice-president directing financial policies; Curtis C. Cooper, vice-president; Alfred P. Sloan, Jr., vice-president; Austin S. Murray, treasurer; Thomas S. Merrill, secretary; George S. Bartholomew, assistant secretary.

Fitzpatrick while vice-president of the General Motors Acceptance Corp. was in close working agreement with Steenstrup of the Export company, thereby gaining an intimate knowledge of the export trade.

Steenstrup as vice-president and general manager of sales and service, relieved of such duties as have been transferred to Fitzpatrick, will be free to devote his whole time and attention to the development of sales and the problems incident to service which are ever present in conducting successfully an overseas business involving as many problems as the motor car business.

Under this new plan the Export company is enabled to care for the enlargement of its organization both at home and abroad through division and realignment of duties and responsibilities.

## TO BUILD TAMPICO HIGHWAY

MATAMOROS, MEXICO, March 28—Construction of an automobile highway between Tampico and Matamoros will be started soon. According to advices received from Tampico the work of securing the right of way for the proposed

road from that city to Victoria, capital of the State of Tamaulipas is already under way. Large American oil interests and the American chamber of commerce of Tampico are promoting the proposed project by the state government. The necessity for a highway that will accommodate automobile traffic between the two points is keenly felt. It will be about 325 miles long.

## Regulations Revised for Pulitzer Trophy

NEW YORK, March 28—Revised rules and regulations have been announced for the second annual Pulitzer Trophy contest to be held at Selfridge Field, Mt. Clemens, Mich., on Sept. 8, 9 and 10, 1921. In order to arouse the widest possible interest in flying and to stimulate the development of commercial aviation, the plans have been elaborated since last year so as to include diversified types of planes.

The intention is to attract a varied field of entries to compete for prizes to be awarded for desirable airplane performance apart from high speed. For this purpose there will be a series of contests comprising four distinct events in one or another of which there will be opportunity for any type of airplane to compete.

The trophies for the three contests besides the Pulitzer race have not yet been announced, but will be specified later.

## UNIVERSAL INCREASES OUTPUT

GARWOOD, N. J., March 28—Steady and growing increases in orders are noted by the Universal Tool Co., Inc., manufacturers of automotive equipment and tools, after a period of depression which extended up to the last week of February. The company, formerly a Detroit organization, is now in extensive operation in its new plant in this city.

A continuance of orders as at present leads the company to the declaration that it will within a short time be doing more business than it was at the pinnacle of the automobile rush last spring.

## Court Order Stops Interlocking Action

AKRON, March 26—Efforts of a group of stockholders of the defunct Interlocking Cord Tire Co. of Akron and Mogadore, to reorganize the company under a new name, have been blocked by order of the Summit county common pleas courts, upon petition of Elihu Harpham, receiver for the company. The court order enjoins the stockholders from making any further collections of stock subscription amounts due the company from stockholders. The injunction also restrains the Ohio Savings & Trust Co. from serving further as collecting agency for the stockholders reorganization project, and requires an account of all moneys collected be made to the receiver.

The stockholders reorganization committee is composed of C. A. Rukamp, R. E. Cartledge, Karl A. Dorn and Herman Gustave who recently were named temporary officers of the company at a stockholders meeting.

Receiver Harpham in formal court charges against the stockholders committee, alleges that there are open accounts on unpaid stock subscriptions, amounting to more than \$242,000. He charges the committee with misrepresentation of facts and with violation of the order of the court in naming him as receiver.

Under the court injunction Harpham will proceed to collect all unpaid amounts due on stock subscriptions, and will proceed at once to liquidate the firm's affairs. Creditors have presented claims for over \$150,000. The Interlocking plant at Mogadore has been shut down for several months.

## FINANCE OFFICES MOVED

NEW YORK, March 28—The Colonial Finance Corp. and the Republic Acceptance Corp., both under the same management, have moved their executive offices from Pittsburgh to this city and are now located at 300 Madison Avenue. The companies are engaged in the automobile and general finance business with branches in Pittsburgh and Detroit.